CESAJ-RD (1145b) APR 11 2002

MEMORANDUM FOR RECORD

SUBJECT: Department of the Army Record of Decision on the Final Programmatic Environmental Impact Statement for the Rock Mining-Fresh Water Lake Belt Plan, Miami-Dade County, Florida, and Statement of Findings on the 12 applications for Department of the Army permits for which the Programmatic Environmental Impact Statement was prepared

1. Applicants: The U.S. Army Corps of Engineers (Corps) received a total of 12 permit applications from 10 mining companies for limerock mining activities as part of the Northwest Miami-Dade County Freshwater Lake Plan.

200002284(IP-DSG): Vecellio & Grogan, Inc. (White Rock Quarries)
101 Sanabury's Way
West Palm Beach, Florida 33416

200002285(IP-DSG): Sunshine Rock, Inc.
2125 Rochester Drive
Montgomery,IL 60538

200002286(IP-DSG): Sawgrass Rock Quarry, Inc.
c/o Fortin, Leavy, Skiles, Inc.
180 NE. 168th Street
North Miami Beach, Florida 33162-3412

200002287(IP-DSG): Tarmac of America, Inc.
455 Fairway Drive
Deerfield Beach, Florida 33441

200002346(IP-DSG): Continental Florida Materials, Inc.
Post Office Box 93-9007
Margate, Florida 33093

200002348(IP-DSG): Lowell Dunn Company
8083 NW. 103 Street
Post Office Box 22577
Hialeah, Florida 33002

200002366(IP-DSG): Pan American Construction
7600 NW. 69th Avenue
Medley, Florida 33166

200002367(IP-DSG): Florida Rock Industries, Inc.
Post Office Box 4667
Jacksonville, Florida 32201-4667

200002369(IP-DSG): Kendall Properties & Investments
c/o Blackwater Partner, LTD.
4300 N. University Drive
Fort Lauderdale, Florida 33351

200002373(IP-DSG): CSR Rinker Materials Corp.
13292 NW. 118th Avenue
Miami, Florida 33178

2. Location, Existing Site Conditions, Project Description, Changes to Project:

a. Location: The projects are located within the Lake Belt area, in southeast Florida, in the Everglades wetlands east of Water Conservation Area 3B and the Everglades National Park Expansion Lands, in the northwest area of Miami-Dade County, Florida. The area encompasses all of Township 52 south, Range 39 east, Township 53 south, Range 39 east, portions of Township 52 south, Range 40 east, and portions of Township 54 south, Range 38 east. The area is generally bounded by Krome Avenue to the west, the Florida Turnpike to the east, the Miami-Dade/Broward County line to the north, and Kendall Drive to the south.

The specific locations for each of the project sites are as follows:

White Rock Quarries: The project is located in waters of the United States immediately east of Water Conservation 3B in Sections 1, 2, 11, and 13, Township 52 south, Range 39 east and

Sections 6, 7, 8, 18, and 19, Township 52 south, Range 40 east, Miami-Dade County, Florida.

Sunshine Rock: The project is located in waters of the United States immediately east of Water Conservation 3B, at NW. 127th Avenue and NW. 194th Street, in Section 2, Township 52 south, Range 39 east, Miami-Dade County, Florida.

Sawgrass Rock Quarry, Inc.: The project is located in waters of the United States immediately east of Water Conservation 3B in Section 3, Township 52 south, Range 39 east, Miami-Dade County, Florida.

Tarmac America, Inc.: The project is located in waters of the United States immediately east of Water Conservation 3B in Sections 27, 26, 34, and 35, Township 52 south, Range 39 east and Sections 1 and 10, Township 53 south, Range 39 east, Miami-Dade County, Florida.

Continental Florida Materials, Inc: The project is located in waters of the United States immediately east of Water Conservation 3B in Section 13, Township 53 south, Range 39 east, Miami-Dade County, Florida.

Lowell Dunn Company: The project is located in waters of the United States immediately east of Water Conservation 3B in Section 13, Township 53 south, Range 39 east, Miami-Dade County, Florida.

Pan American Construction: The project is located in waters of the United States immediately east of Water Conservation 3B in Sections 16, 23, and 24, Township 53 south, Range 39 east, Miami-Dade County, Florida.

Florida Rock Industries: The project is located in waters of the United States immediately east of Water Conservation 3B in Sections 9, 15, 21, 23, 23, 25, and 26, Township 53 south, Range 39 east, Miami-Dade County, Florida.

Kendall Properties and Investments: The project is located in waters of the United States immediately east of the Everglades National Park Expansion Lands in Sections 24, 25, and 36, Township 54 south, Range 38 east, Miami-Dade County, Florida.

CSR Rinker Materials Corp.: The project is located in waters of the United States immediately east of Water Conservation 3B, southwest of the intersection of Okeechobee Road (US 27) and the Homestead Extension of the Florida Turnpike, in Sections 28 and 33, Township 53 south, Range 39 east and Sections 10, 14, 15, 21, 22, 23, 26, 27, and 28, Township 52 south, Range 39 east, Miami-Dade County, Florida.

b. Existing Site Conditions: The Lake Belt area comprises approximately 57,515 acres, approximately 90 square miles, of land. Rock mining and agriculture activities have altered approximately 30 percent of this total acreage. The altered areas are generally along Okeechobee Road and along the eastern side of the area. The remaining areas, 70 percent of the property, are generally unaltered. Vegetation coverage includes wet prairie with varying amounts of melaleuca, tree islands and willow heads, and dense stands of melaleuca. The wet prairies are found primarily within an area known as the Pennsuco and in the western areas along the Dade-Broward Levee. Less than 1 percent of the area is occupied by indigenous wetland forested vegetation community types and melaleuca is expanding rapidly in a westerly direction.

The Lake Belt area topography is flat with elevations generally less than 20 feet NGVD. Topsoil consists of organic sediments. Surface water flows have been modified due to excavation of canals, drainage patterns, and existence of the wellfield. Water resources within the Lake Belt Area include groundwater, natural wetlands, and two types of man-made surface waters: borrow pits and canals. The Biscayne Aquifer, which is the primary source of drinking water for the Miami-Dade County area,

lies beneath the Lake Belt Area. The aquifer begins beneath the overlying wetland soils and extends to a depth of approximately 100 feet. The aquifer is composed of varying limestone-bearing materials such as shells, coral, and sand. Borrow pits are man-made lakes created by the extraction of limestone. The Northwest Wellfield, comprised of 15 wells, is located on the eastern edge of the Lake Belt and supplies approximately 40 percent of the potable water for Miami-Dade County.

The mining industry owns approximately 46 percent of the land within the Lake Belt, government agencies own approximately 19 percent, and the remaining 35 percent is owned by approximately 1,800 private landowners. Other land uses include agriculture, rural residences and a small number of commercial, industrial and public service uses.

c. Project Description: The applicants propose to place fill material in waters of the United States, covering approximately 15,800 acres, for land clearing and other activities associated with rock mining operations. The applicants have requested 50-year permits.

d. Changes to Project: Based upon concerns raised for the 50-year permit with associated impacts, the applicants requested 10-year permits with 5,409 acres of fill.

The enclosed table, labeled "Impacts for the first 10 years for each mining company," provides a breakout of the impacts, in acres, for each mining company for a 10-year permit.

e. Three sources of the number of acres of mining are used in this memorandum. This situation is the result of the long time that this project has undergone review. The first is the one prepared for the EIS and is used in Tables A through E to describe the 50 year plan. The second is the analysis conducted by Biological Resource Associates (BRA) used in Tables D and F to describe the 10 year plan. The third is one prepared by Fortin, Leavy, Skiles, Inc. (FLS) provided to the FDEP for the

permits for the 10 year plan. The EIS figures are based on the estimated mining plan but those plans have not been refined to incorporate actual setback distances from such things as existing canals so the tabulation includes acres of canals. This does not detract from the analysis of the cumulative 50 years of impacts since that is an estimate and this lack of refinement probably results in an overestimate. The BRA and FLS acres have slight differences arising from several causes, including: the BRA analysis included adjusting the map to georeferenced photos; the FLS analysis incorporated information from the applicants on the extent mining that has taken place since the photos; and, there are inevitable slight differences resulting from having two different persons drawing and measuring maps at two different scales (digitizing difference). Both sets of figures are used to provide an estimate of the acres that will occur within the mapped boundaries. The actual impacts will be reported annually and the quantity of wetland compensatory mitigation required is linked to actual quantity. The Corps has used the BRA figures since they are broken down by vegetation type so that an ecological assessment can be performed. The FLS numbers were used by the FDEP in their permits. The Corps is using the same maps as the FDEP.

a. Florida Rock. BRA totals 725.8 acres, and both FLS and the DEP show 658.58. This appears to be a digitizing difference.

b. Tarmac. BRA totals 989.4 acres, FLS 1030.65 and DEP 912.25. BRA and FLS appear to be a digitizing difference. FDEP apparently inadvertandly used just the "deep cut" acres, not haul roads.

c. White Rock. BRA totals 941.7 acres, FLS 729 and DEP 729. The FLS drawing has larger lakes then the BLS drawing because FLS had information from this applicant on the lake excavation that took place since the date of the aerial photograph used by BRA. Since the current size of lake information is not available for all the miners, the Corps will use the BRA number for its estimate of impacts to maintain

consistency in the numbers, even thought that results in an overestimate. The annual reports are the method of providing the actual impacts by which the Corps will judge the progress of the mitigation plan.

d. Sawgrass. BRA totals 137.02 acres, FLS 82.6 and DEP 112.47. FDEP appears to have inadvertenly left off 25.02 acres of littoral ares. The initial FLS number did not include the existing developed areas used for haul road and processing plant.

e. Sunshine. BRA totals 68.7 acres, FLS 70.1 and DEP 38.04. Appears to be only a digitizing difference between BRA and FLS and apparently DEP inadvertently left off one of the numbers provided to them by FLS. The maps are the same.

f. Rinker FEC. BRA totals 1,101.2 acres, FLS FLS 1,111 and DEP 1,101.92. Appears to be a digitizing difference only.

g. Rinker SCL. BRA totals 325.5 acres, FLS 336 and DEP 325.34. Appears to be a digitizing difference only.

h. APAC. BRA totals 410.6 acres, FLS 407.74 and DEP unavailable. Appears to be a digitizing difference only.

i. Lowell Dunn. BRA totals 122.1 acres, FLS 132.78 and DEP unavailable. FLS drew straight line across existing lake and BRA digitized around lake edge, so FLS includes some existing lake. Otherwise same map.

j. Continental. BRA totals 146.9 acres, FLS 125.48 and DEP unavailable. The FLS drawing has larger lakes then the BLS drawing because FLS had information from this applicant on the lake excavation that took place since the date of the aerial photograph used by BRA. Since the current size of lake information is not available for all the miners, the Corps will use the BRA number for its estimate of impacts to maintain consistency in the numbers, even thought that results in an

overestimate. The annual reports are the method of providing the actual impacts by which the Corps will judge the progress of the mitigation plan.

k. Kendall. BRA totals 536.7 and the others are unavailable at the time of this memorandum. However, the maps being used are the same.

3. Project Purpose:

a. Basic: The basic project purpose is to extract limestone.

b. Overall: The overall project purpose is to provide construction-grade limestone from Miami-Dade County, Florida.

4. Scope of Analysis: The scope of analysis includes the cumulative impacts on the entire Lake Belt area. Due to possible impacts of seepage and potential loss of wetland functions, the scope of analysis extends to the Water Conservation Area 3B to the west. For purposes of the economic impacts, and potential impacts to the wellfield from which Miami-Dade County obtains its potable water, it includes the county and the southeast Florida region.

5. Statutory Authority: Section 404 of the Clean Water Act of 1972 (33 U.S.C. 1344), as amended.

6. Other Federal, State, and Local Authorizations Obtained or Required and Pending:

a. State water quality certification (WQC): The Florida Department of Environmental Protection (DEP) has received and is evaluating applications for each applicant. The DEP has issued water quality certification for the following applicants:

(1) Sunshine Rock Inc.: Water quality certification was issued on 19 November 2001. The DEP permit number is

0175266-001. Construction under the permit can continue until 19 November 2011.

(2) Sawgrass Rock Quarry: Water quality certification was issued on 8 October 2001. The DEP permit number is 0175268-001. Construction under the permit can continue until 8 October 2011.

(3) White Rock Quarries, Inc.: Water quality certification was issued on 13 August 2001. The DEP permit number is 0175273-001. Construction under the permit can continue until 13 August 2011.

(4) Tarmac America, L.L.C: .: Water quality certification was issued on 11 February 2002. The DEP permit number is 0175263-001. Construction under the permit can continue until 11 February 2012.

(5) Florida Rock Industries, Inc.: Water quality certification was issued on 21 February 2002. The DEP permit number is 0175235-001. Construction under the permit can continue until 21 February 2012.

(6) Rinker Material Corporation: Water quality certification was issued on 21 February 2002 for the FEC Quarry. The DEP permit number is 0175244-001. Construction under the permit can continue until 21 February 2012.

Water quality certification was issued on 21 February 2002 for the SCL Quarry. The DEP permit number is 0175252-001. Construction under the permit can continue until 21 February 2012.

(7) Lowell Dunn Company: Water quality certification was issued on 21 February 2002. The DEP permit number is 0175240-001. Construction under the permit can continue until 21 February 2012.

(8) Pan American: Water quality certification was issued on 2 April 2002. The DEP permit number is 0175232-001. Construction under the permit can continue until 2 April 2012.

(9) Kendall Properties and Investments, Inc.: Water quality certification was issued on 2 April 2002. The DEP permit number is 0175262-001. Construction under the permit can continue until 2 April 2012.

The remaining application for Continental Florida Materials, Inc. is pending with the DEP.

b. Coastal Zone Management (CZM) consistency/permit: There is no evidence or indication from the State of Florida that the project is inconsistent with the Florida CZM. Issuance of a DEP permit certifies that the project is consistent with the CZM plan.

c. Other authorizations: The applicants are seeking authorizations at the County level.

Whiterock has received Class IV permits from Miami-Dade County for these mining activities. Permits numbers are FW-92-139, FW-95-003, FW-90-014, FW-90-048, FW-87-105, FW-97-105A, and FW-89-105.

Florida Rock has received Class IV permits from Miami-Dade County for these mining activities. Permits numbers are FW-96-057, FW-96-057A, FW-88-138, FW-86-070. Two additional permits are pending.

7. Date of Public Notice and Summary of Comments:

a. Important dates: The Corps received the applications on the following dates:

(1) White Rock Quarries: 1 November 1999

(2) Sunshine Rock, Inc.: 30 July 1998.

(3) Sawgrass Rock Quarry: 31 January 2000

(4) Tarmac of America, Inc.: 15 May 2000

(5) Continental Florida Materials, Inc.: 16 May 2000

(6) Lowell Dunn Company: 17 May 2000

(7) Pan American Construction: 19 May 2000

(8) Florida Rock Industries, Inc.: 18 May 2000

(9) Kendall Properties & Investments: 18 May 2000

(10) CSR Rinker Materials Corp.: 18 May 2000

The Corps was receiving applications at the same time it was preparing an environmental impact statement. The final environmental impact statement was issued May 2000. The Corps considered the applications complete on 5 June 2000. The Corps issued a 30-day public notice on 21 June 2000, and sent this notice to all interested parties including appropriate State and Federal agencies.

On 1 March 2001, the Corps issued another 30-day public notice advertising the project as a 10-year permit with impacts over 3,960 acres.

b. Public notice comments: The Corps has reviewed all of the comments submitted in response to the circulation of the public notices. The Corps has summarized these comments below:

(1) U.S. Environmental Protection Agency (EPA): By letter dated 21 August 2001, the EPA provided comments to the June 21, 2000, public notice. The EPA has serious wetland and

drinking water concerns within the 50-year plan. The EPA supports the Miami-Dade County's concerns for wellfield protection and is working with the County to develop the wellfield watershed protection plan and risk assessment and ensure future mining will not increase the risk of pathogens and other contaminants from entering the water supply. The EPA recommends any mining occurring the Northwest Wellfield would adhere to the County's setback requirements. Resolution of the mitigation plan needs to be reached prior to permit issuance for the EPA to support issuance of a permit. Relative to the proposed permit template, the EPA recommends periodic interagency reviews occur at least every 5 years with the initial interagency review 3years after the issuance of permits. At this time, EPA recommends the Corps not issue permits. The EPA stated the project may result in substantial and unacceptable impacts to aquatic resources of national importance. Mr. Richard Harvey, Director, signed the letter.

By letter dated 18 September 2000, the EPA stated the project will have unacceptable and substantial impacts on aquatic resources of national importance. The letter was signed by Mr. Sam D. Hamilton, Regional Director.

Included with the letter from Mr. Hamilton was a letter dated 15 September 2000, signed by Mr. John H. Hankinson, Jr., Regional Administrator. It too referenced the Memorandum of Agreement (MOA) between our agencies and that the project will impact aquatic resources of national importance. Mr. Hankinson's letter reiterated EPA concerns in its 21 August 2000, letter. In addition, the EPA is in support of the development of "bridging" permits of 3-year to 5-year duration.

(2) U.S. Fish and Wildlife Service (USFWS): By letter dated 21 August 2001, the FWS provided comments to the 21 June 2001, public notice. The FWS does not concur with the Corps' determination on any listed endangered species. To complete the initiation package, FWS requested a thorough

analysis of potential effects to the species, description and analysis of the measures taken to avoid and minimize impacts to the species, measures to protect the species during and after the project, and an analysis of cumulative effects. Once the information is received, the FWS can begin consultation. The FWS requested the following be provided:

1. a comprehensive mitigation plan that will identify specific lands and/or options necessary to satisfy the mitigation needs, with emphasis on expected hydrological impacts from mining, and

2. a detailed mitigation plan for the Pennsuco Mitigation Area with the technical feasibility of the mitigation, a system of accounting, monitoring plan, and success criteria. In addition, the plan should be reviewed by the Mitigation Bank Review Team.

The FWS recommends limiting permits to 20 years, with periodic reviews every 3 years; acquiring/donating lands within the Pennsuco up front; transfering post-mining lands to an appropriate public entity; and establishing a 2,000-foot setback from the L-31 N Canal south of Tamiami Trail until such time it can be demonstrated rock mining would not adversely affect hydrology or other resources in the Everglades National Park.

The FWS recommended denial of the project and stated the project may affect aquatic resources of national importance.

(3) National Marine Fisheries Service (NMFS): By letter dated 17 July 2000, the NMFS stated the agency had no objections to the issuance of permits for mining operations in the Lake Belt area.

(4) State Historic Preservation Officer (SHPO): By letter dated 18 July 2000, the SHPO recommended the site be subjected to a systematic, professional archaeological and historic survey before starting any land clearing or ground disturbing activities.

(5) National Park Service (NPS): By undated letter received 22 August 2000, the NPS recommended denial of the project. The NPS believes the EIS is incomplete and issued prematurely, there is a lack of Federal oversight of the mitigation fund, the mitigation plan is incomplete, a 50-year permit is too long and interim reviews inadequately defined, and the treatment of tree islands and littoral shelves is inadequate. The NPS suggests lands between the park and Krome Avenue and Bird Drive Basin be considered as possible sites for mitigation. The effects of the increased seepage caused by expansion of the lakes have not been addressed. Everglades National Park identified a 2000-foot setback from the L-31N canal of no mining to protect park resources from potential adverse impacts. The NPA shares the concerns over possible contamination of the Northwest Wellfield.

(6) State and local agencies:

(a) Miami-Dade County, Office of Community and Economic Development, Historic Preservation Division: By letter dated 17 July 2000, the Historic Preservation Division stated, based on available information, there were 29 archaeological sites, rather than 27 noted in the public notice. The Historic Preservation Division believes preservation of a site should not be discounted as an option until the site’s significance has been adequately evaluated and it is clearly established that preservation is not feasible.

(b) South Florida Regional Planning Council: By letter dated 17 July 2001, the Council stated the project’s compensatory mitigation contribution should be consistent with future appropriate levels of compensatory mitigation outlined in

the final EIS. In addition, the Council recommends, if the permit is granted, impacts to the natural systems be minimized to the greatest extent feasible and the extent of sensitive wildlife and vegetative communities in the vicinity be determined and protection and/or mitigation of disturbed habitat be required.

(c) Metropolitan Dade County Office of the County Manager: By letter dated 19 July 2000, Mr. M. R. Stierheim, County Manager, requested a public hearing. Furthermore, Mr. Stierheim requests the permits be denied until a watershed protection program is in place and an adequate compensatory mitigation plan is prepared. Mr. Stierheim is concerned that the removal of rock would result in a decrease in time for a contaminant, which is likely to contain more disease-causing organisms, to travel from the resultant lake to the nearby Northwest wellfield. One organism in particular, *Crytosporidium*, is capable of surviving 1 year in water and has been detected within canal in Miami-Dade County. Cost for the County to upgrade the water treatment plants to provide adequate protection from these organisms would be approximately $250,000,000.

(d) Florida Department of Transportation (FDOT): By letter dated 21 July 2000, FDOT states hauling rock out of Miami-Dade County has an impact on community traffic patterns and issuance of a 50-year permit would continue to impact community patterns. More commercial and residential developments are being constructed along the travel corridors.

(7) Organizations:

(a) By letter dated 19 July 2000, the Florida Power and Light Company (FPL) expressed concern about the compatibility of mining activities and future large impoundment areas with FPL's future and existing facilities in the area. Mining in close proximity to FPL's right-of-ways gives the company cause for concerns with respect to safety and

reliability. FPL is concerned about impacts from blasting, dust contamination, movement of large mining equipment across FPL's right-of-ways, and the stability of existing right-of-ways after mining operations. FPL recommends a special condition be included in the permit for the mining companies to seek approval from FPL prior to mining closer than 500 feet from their right-of-ways.

By electronic mail message dated 28 August 2000, FLP suggested the following language be incorporated into the permit as a special condition: "…should coordinate and cooperate with FPL to ensure safety and protection to FPL facilities throughout the mining process." The respective company name would be inserted at the beginning.

(b) Audubon of Florida: By undated letter received on 19 July 2000, Audubon of Florida stated the organization is concerned about wellfield protection, maintaining water quality, and that there is no specific wetland mitigation plan. Audubon recommends issuance of a 50-year permit with 5-year reviews and that the project be coordinated with other planning processes for the area.

(c) Sierra Club: By letter dated 18 August 2000, the Sierra Club expressed strong opposition to the issuance of a Department of the Army permit, stating that it would be inconsistent with the requirements of the Clean Water Act. The Sierra Club stated the public notice did not include locations of the separate projects; discuss whether each site had been impacted by mining activities; or analyze native wildlife, threatened or endangered species, or unique characteristic of each of the sites. Since, site-specific information was not provided in the public notice, the public was not able to provide useful comments. The Corps has failed to comply with the requirements of the Clean Water Act, and no permits should be issued.

Additionally, Sierra Club stated the Corps must ensure the activities comply with the 404(b)(1) Guidelines and conduct a public interest review; the destruction of wetlands for rock mining does not comply with the 404(b)(1) Guidelines nor can it survive a public interest review; no alternative analysis has been prepared for each individual site; altering Everglades wetland habitat and creating unnatural lakes over the next 50 years is detrimental and not in the public interest; and mining will result in the alteration of hydrology and water quality and habitat. The Sierra Club strongly opposes the "mine now, mitigate later" approach the Corps is taking and contends a mitigation plan must be developed prior to the issuance of any Department of the Army permits.

The Corps has violated the National Environmental Policy Act (NEPA) in failing to provide adequate opportunity for notice and comment and in failing to conduct adequate site-specific review for each individual site. The Corps has not addressed the environmental issues and is including conditions that would rely on the mining industry to voluntarily resolve outstanding issues after permits are issued. The Corps should not issue any permits until the Phase II Master Plan is complete and environmental issues are resolved and disclosed to the public.

The Corps has not complied with the Endangered Species Act by not seeking formal consultation and in not requiring a more detailed analysis of the impacts from mining on the wood stork. Issuance of these permits would impair the recovery of other endangered species such as the Cape Sable seaside sparrow, snail kite, and crocodile. Similarly, the Corps has failed to address impacts on species protected under the Migratory Bird Treaty Act. The Corps has not conducted the required consultation with the FWS pursuant to the Fish and Wildlife Coordination Act. The Corps has not fully considered the effects the project would have on historic sites eligible for listing in the *National Register of Historic Places*. The Corps needs to take into

account and attempt to avoid adverse impacts to historic sites. The project area should be subjected to systematic, professional surveys and consultation with the SHPO should occur.

The Corps will be authorizing impacts to "the last remnant of the short hydroperiod marshes that are critical to the proper functioning of the Everglades ecosystem" without adequate justification or compliance with applicable laws. Evaluation of all mining permits should be suspended until the Corps is able to fully study the unresolved environmental issues and ensure issuance of a permit would be compatible with the future health and recovery of the Everglades ecosystem.

(8) Individuals:

(a) By undated letter received on 30 June 2000, Mr. Ricardo Sabates requested a public hearing. Mr. Sabates owns 10 acres adjacent to an existing lake owned by White Rock Quarries. Mr. Sabates feels further dredging activities would disturb his peaceful enjoyment of his property.

(b) By letter dated 28 June 2001, Dr. Miriam Alonso, Miami-Dade County Commissioner, request a public hearing on behalf of homeowners in District 12.

By letter dated 16 August 2000, Dr. Alonso reiterated the need for multiple public hearings and that they should be held in September to allow for maximum participation of those impacted. Dr. Alonso's concerns seemed allude to possible impacts as a result of blasting.

d. The following comments were received in response to the revised public notice dated 1 March 2001:

(1) NMFS: By electronic mail message dated 5 March 2001, the NMFS stated the resources affected are not ones under the responsibility of the NMFS. Therefore, the NMFS has no comments.

(2) Audubon of Florida: By letter dated 26 March 2001, Audubon of Florida stated it was not appropriate for the Corps to issue 10-year mining permits while there are several ongoing studies related to wellfield protection and seepage impacts. Audubon recommends a permit duration be established for a period not to exceed 3 years and upon expiration similar permits be issued for the same duration based upon findings of the wellfield protection and seepage studies. The Audubon believes the fee per ton mitigation fee is inadequate and that the Corps has not addressed this concern. The Audubon requests that an interagency committee immediately reevaluate the mitigation fee, reevaluate mitigation fee growth time tables to account for potential acceleration of mining activities, report findings to the Corps and the Governing Board of the South Florida Water Management District, identify sufficient land to fulfill the necessary mitigation ratio, obtain transfer of ownership of excavated quarries to public ownership at no additional cost, incorporate littoral shelves in mining plans at a minimum of 100 feet around the perimeter of each 1 square mile quarry, and develop the fee structure to exclude the expenditure of other state or federal funds. The Corps should not authorize mining near the existing 60-day travel setback until the wellfield protection plan has been adopted. Furthermore, no permits should be issued adjacent to L-31N and Everglades National Park for 4-10 years, until such time seepage studies have been completed. Issuance of a permit for mining in the western half of the area known as the Florida Power and Light Strip would be contrary to the recommendations of the Miami-Dade County Lake Belt Advisory Committee and the Phase II Lakebelt Plan.

(3) Dr. Sydney Bacchus: By electronic mail message dated 27 March 2001, Dr. Bacchus stated the proposed project appears to be in conflict with two bills within the Florida Legislative session that are reportedly crucial to the restoration of the Everglades. Adverse impacts on the Biscayne

aquifer would be "significant," not only from an environmental standpoint, but also from an aquifer-supply standpoint. Dr. Bacchus requested a public hearing.

(4) Unidentified commenter at MISSGRITS@aol.com: By electronic mail massage dated 26 March 2001. "MISSGRITS" urges the Corps to deny the permits. The mining activities would undermine the restoration of the Everglades and have adverse impacts on wildlife and hydrology.

(5) Mr. Dennis Henize: By electronic mail message dated 27 March 2001, Mr. Henize stated issuance of a permit for rock mining would be unthinkable given the current water emergency in South Florida.

(6) Mr. Boyce Rensberger: By electronic mail message dated 27 March 2001, Mr. Rensberger stated he objected to the issuance of a permit for rock mining activities around Miami.

(7) South Florida Regional Planning Council: By letter dated 27 March 2001, the South Florida Regional Planning Council repeated comments made in their 17 July 2000, letter.

(8) Citizens Against Blasting: By letter dated 29 March 2001, Mr. Michael A. Pizzi, Jr., President of Citizens Against Blasting, requested the Corps not issue any permits for blasting in the Lake Belt area and hold a public hearing. Homeowners in South Florida believe rock mining with the associated blasting has damaged the environment, homes, and personal property.

(9) Ms. Betty G. Buckley: By electronic mail message dated 27 march 2001, Ms. Buckley urged the Corps to deny the permits for rock mining in the Everglades wetlands. The project could harm wildlife, the drinking water supply for Miami-Dade County, water supply to Everglades Park, and damage homes due to blasting.

---

(10) Miami-Dade County Department of Environmental Resources Management (DERM): By letter dated 30 March 2001, DERM requested the Corps deny issuance of permits. Concerns regarding the Northwest Wellfield protection have not been resolved. An adequate program to monitor and protect the Northwest Wellfield from water quality impacts, including pathogenic contamination, has not been developed. DERM requested a public hearing.

By letter dated 12 April 2001, DERM wanted to clarify that comments previously made in their 30 March 2001, letter did not apply to lands in the revised public notice located outside of the wellfield protection areas.

(11) Sierra Club, the National Resources Defense Council (NRDC), Friends of the Everglades, and the National Parks Conservation Association (NPCA): By letter dated 30 March 2001, Mr. Jonathan R. Lovvorn provided comments on behalf of the Sierra Club, et al. All continue to recommend the permits be denied. Authorizing the destruction of thousands of acres of Everglades wetlands "presents not only an immediate and substantial threat to the continued health and future restoration of the Everglades National Park, but constitutes a flagrant violation of numerous statutes and regulations." The Corps fails to provide the public with relevant information on the pending applications. Reduction of the duration of the permit does not solve the legal and environmental problems associated with mining within the Lake Belt area.

Splitting the activity into smaller permits is contradictory to the purpose of preparing the environmental impact statement (EIS) for rock mining in the area: to address cumulative impacts, resolve outstanding issues association with mitigation, and ensure future mining would be conducted that is compatible with the long-term health of the Everglades ecosystem. As previously pointed out, the EIS was flawed and inadequate; rather than address the inadequacies of the EIS, the Corps proposed to piece-meal the project.

The Corps has not resolved issues associated with mitigation, potential hydrological damage to Everglades National Park, contamination of local ground water, loss of habitat, and loss of cultural resources. The Phase II Plan does not resolve these outstanding issues. Both the Corps and the Lakebelt Committee has passed resolution of these issues back to the other. A comprehensive mitigation plan needs to be fully developed, funded, and implemented before additional mining is authorized. Routinely, miners failed to follow through with mitigation by not completing all mining within a specific pit; completion of mining typically triggers the implementation of the mitigation plan. Issuance of a permit to perform mining would be inconsistent with procedural and substantive requirements of the Comprehensive Everglades Restoration Plan (CERP).

(12) Environmental & Land Use Law Center, Inc.: By letter dated 30 March 2001, the Environmental & Land Use Law Center stated they support the comments and recommendations of the Audubon of Florida.

(13) Dr. Miriam Alonso, County Commissioner for District 12: By letter dated 2 April 2001, Dr. Alonso again requested a public hearing. A public hearing should be held for each of the application being reviewed to ensure all have a chance to attend and bring forth concerns.

(14) Ms. Gracie Coffey: By electronic mail message dated 30 March 2001, Ms. Coffey requested the Corps deny permits for rock mining activities. Creation of open pits would undermine the restoration of the Everglades.

(15) EPA: By letter 26 April 2001, the EPA reiterated its concerns about unresolved resource issues needing to be addressed in order for the agency to evaluate the proposal. EPA maintains its objections. EPA needs assurance that the rock miners will offer land held within the Pennsuco for sale at appraised value or for exchange, the fee-per-ton-mitigation fee

would be applied only to acquisition and restoration of wetlands within the Pennsuco, the adequacy of the fee would be re-examined and approved by the EPA prior to other uses, the location of mining in advance, the littoral shelves will be connected for contiguous habitat, success criteria will be described, assurance for success, required monitoring and reporting criteria will be described, a list will be provided of other sites available for additional mitigation, EPA will participate in review of any issued permits, and assurance for continued involvement in the Mitigation Oversight Committee.

The EPA also recommends any mining proximal to the Northwest Wellfield be consistent with Miami-Dade County's recommendations for setbacks, pending the completion of the risk assessment and wellfield protection plan. The EPA supports water quality monitoring near the wellfield and on miner's lands. The EPA continues to recommend denial of these permits and continues to believe the project will affect aquatic resources of national importance. Mr. A. Stanley Meiburg, Acting Regional Administrator, signed the letter.

(16) FWS: By letter dated 30 April 2001, the FWS reiterated the need for the following information:

1. a thorough analysis of potential effect to the wood stork,

2. a description and analysis of measures taken to avoid and minimize impacts to the wood stork, measure to protect the species during and after the project, and

3. an analysis of cumulative effects.

The FWS suggests the Corps confirm land owned by the miners within the Pennsuco will be offered for sale at appraised value; provide a detailed description of the criteria being evaluated at the 3-year period with options used to correct inadequacies; require a detailed proposal from each company for the

development of littoral shelves to include location, construction design, and performance measures; clarify enhancement efforts; and provide accurate mining plans. The FWS suggests the applicants donate "significant" portions of the lands within the Pennsuco up front to alleviate temporal loss of wetland functions and values. The FWS recommends the mining companies transfer post mining properties to a public entity for long-term management. The FWS also recommends the required 47 acres of littoral shelf per section be combined to maximize wildlife habitat value. In absence of the above, the FWS recommends denial of the permits and states the project may affect aquatic resources of national importance.

By letter dated 11 May 2001, the FWS stated the project will affect aquatic resources of national importance.
Mr. Sam D. Hamilton, Regional Director, signed the letter.

By letter dated 22 June 2001, the FWS stated the project would not result in the destruction of any wood stork rookeries and the agency concurs the proposed project is not likely to adversely affect the wood stork.

(17) National Park Service: By undated letter received on 8 May 2001, the National Park Service recommends the area between 1,000 feet and 2,000 feet of the L-31N canal should not be mined; this area should be considered for a field test of the seepage barrier approach under consideration by the Corps and the South Florida Water Management District for CERP. A methodology for measuring impacts of the expansion of deep water lakes should be developed before permits are issued. The Corps should provide a detailed description of the criteria under review at the 3-year mark and what options would be utilized to resolve any inadequacies. Littoral shelf designs are needed from each of the mining companies, to include information regarding location, construction design, and performance measures. The Corps needs to identify how enhancement measures will be carried out and benefits measured. Wetland loss should be mitigated up front through an accelerated purchase of lands

within the Pennsuco and post-mining lands be donated to an appropriate public entity for long-term management. Finally, littoral shelves should be designed to maximize habitat function and values.

(18) Ms. Patricia Peabody: By letter dated 14 May 2001, Ms. Peabody requested the Corps put a stop to the rock mining activities.

(19) Mr. Bill Hosford: By letter dated 22 May 2001, Mr. Hosford urged the Corps to implement the Everglades restoration legislation and recommended permits for rock mining be denied. Permitting rock mining activities in the Lake Belt area would undermine the Everglades restoration plan and adversely effect wildlife and hydrology.

(20) Sierra Club, the Natural Resources Defense Council (NRDC), and Friends of the Everglades (FOE): By letter dated 17 December 2001, Mr. Jonathan R. Lovvorn of Myers & Glitzenstein requested on behalf of the Sierra Club, NRDC, and FOE that the Corps request formal consultation with the FWS because of what they believe to be "significant new information." A recent report from the South Florida Water Management District (SFWMD) shows approximately 90 percent of all wood stocks in the Everglades National Park are nesting directly adjacent to the Lakebelt project site. This population will be adversely affected by the proposed mining activities. The biological assessment prepared and subsequent FWS' concurrence letter of effect determination relied on the assertion that no major wood stork colonies were located near the project site. The Tamiami West colony is located 4.6 miles from the southwest border of the Lakebelt area and is three times larger than any other colony in southern Florida. The biological assessment identified a 12-mile foraging radius from each nesting colony. The Lakebelt area, then, would be part of their foraging radius. Based upon this information, there is a need for consultation pursuant to Section 7 of the Endangered Species Act. Department of the Army permits should not be issued until consultation has been initiated and completed.

(21) The Natural Resource Defense Council and Sierra Club, by letter dated January 25, 2002, requests preparation of a Supplemental Environmental Impact Statement (SEIS) before issuance of the proposed permits for the following reasons.

(a) The FEIS relied upon hydrologic modeling that did not incorporate CERP components. Since the FEIS, the Corps has released the Water Preserve Areas Feasibility Study (WPA Plan) that proposes a significant re-engineering of the water system. "CERP's passage and the release of the WPA Plan demonstrates that public goals and purposes for the Lakebelt area and the Corps' activities in this area have changed significantly since the FEIS was compiled." An SEIS would provide opportunity to better assess the relationship between mining activities and hydrologic impacts. The new modeling is considered more detailed and accurate than that utilized in the FEIS. An August, 2000, SFWMD memorandum reported results of hydrologic modeling of the effects of mining on the CERP, including a 34% increased seepage to the east out of WCA-3B and the Pennsuco. The letter also questions the reliance on Pennsuco for mitigation.

(b) The FEIS relied upon the Phase II Master Plan which was yet to be prepared. However, the plan when completed after the FEIS did not include promised detailed mitigation plans.

(c) The FEIS identified the Pennsuco wetlands as the primary site for wetland mitigation.

(d) The FEIS stated the project would utilize a mitigtion ratio of 2.5:1, yet the Corps appears, based on a recent draft template, to rely soley on timely payments by the miners into a State fund. The State fund is intended for use in the Pennsuco and the FEIS states plainly that the Pennsuco will not provide enough. Also, numerous parties have raised concerns about the fee concept itself.

(e) The FEIS stated mining would not be permitted closer then 2,000 feet of the L-31N canal. One of the proposed permits gets as close as 1,000 feet. Everglades National Park stated it had serious concerns.

(22) Natural Resource Defense Council and the Sierra Club, by letter dated February 12, 2002, stated its letter is a supplement to its earlier request for a Supplemental Envioronmental Impact Statement and requested the Corps consider 93 documents enclosed with the letter in making its determination. By letter dated February 28, 2002, they submitted an additional 44 documents.

(23) Ms. Joann Don, Naples, Florida, by message left on telephone, stated she is against handing permits to miners.

(24) Mr. Tom Moss, Naples, Florida, by telephone, asks the permits for rock mining be turned down out of concern for runoff into lake reach aquifer. Used to dive in these and know the bottom is muddy.

e. Other comments.

(1) The Corps has received many hundreds of emails from individuals who click the NRDC "Biogems" website page http://www.savebiogems.org/everglades/takeaction.asp?step=2&item=175. These state "I urge you to stop the proposed "Lake Belt" mining project until further environmental studies are completed. This project would eventually leave a 30-square-mile hole in the Everglades, destroying huge swaths of wildlife habitat that is already vanishing at the rate of 3 to 5 acres every day and contaminating local drinking water supplies in the process. As you move forward with developing the $8 billion dollar Everglades restoration program, I also urge the Army Corps of Engineers to live up to its promise to direct 80 percent of the water the restoration plan produces to the Everglades, NOT to water utilities. Also, the Corps must include

the Department of Interior as a full partner in restoration efforts. As the greatest subtropical wilderness in North America, the Everglades must be preserved for current and future generations to enjoy. I urge you to take immediate action to ensure the Everglades are on the fast track to true restoration."

(2) The Corps has received many hundreds of emails from individuals who click the NRDC website page http://www.nrdcaction.org/index.asp?step=2&item=999. These state "I urge the Army Corps of Engineers to not issue the currently proposed permits for limestone mining activities in the Everglades until a Supplemental Environmental Impact Statement has been conducted. Mining the Everglades would irreversibly destroy critical wetlands and endangered species habitat, harm Everglades restoration, contaminate local drinking water supplies, and cost taxpayers hundreds of millions of dollars. Plus, we have no guarantees that the resulting open pits would function safely or effectively as reservoirs in the future. The Everglades wetlands ecosystem has already been devastated by a century of destructive human activity, and must be protected from further harmful practices. Again, do not allow mining in this area until we know whether it can be done safely and without unacceptable environmental impacts."

(3) The Corps has received several thousand facsimiles originating from Carol/Trevelyan Strategy Group, 456 Charnelton Building, Eugene, OR 97401, a consulting firm in Oregon that designs web pages, including the ones for NRDC, World Wildlife Federation, and other groups. These state "I urge the Corps of Engineers to not issue the currently proposed permits for limestone mining activities in the Everglades until a Supplemental Environmental Impact Statement has been conducted. Mining the Everglades would irreversibly destroy critical wetlands and endangered species habitat, harm Everglades restoration, contaminate local drinking water supplies, and cost taxpayers hundreds of millions of dollars. Plus, we have no guarantees that the resulting open pits would

function safely or effectively as reservoirs in the future. The Everglades wetlands ecosystem has already been devastated by a century of destructive human activity, and must be protected from further harmful practices. Again, do not allow mining in this area until we know whether it can be done safely and without unacceptable environmental impacts."

(4) Numerous individuals have sent letters using the text from the above three form letters, sometimes with minor additions or modifications that don't change the nature of the comment.

(5) The Corps has received numerous form letters stating "Limestone mining in the Everglades is bad for the citizens of Florida and bad for the environment. It will destroy over 20,000 acres of this unique wetland system that has already been devastated by human activity. I urge you to protect the Everglades from more harmful practices, don't issue limestone-mining permits. Mining the Everglades is the wrong way to go. It will irreversibly destroy critical wetlands and endangered species habitat, contaminate local drinking water supplies, cause noise pollution, cost taxpayers millions and not provide acceptable mitigation measures. Half of the Everglades have already been destroyed by shortsighted human activities, do not allow any more.

f. Comments to the Final Environmental Impact Statement:

(1) Audubon of Florida and Tropical Audubon: Audubon of Florida together with Tropical Audubon submitted comments to the Final EIS originally issued in June 2000, but revised in July 2000. The Audubon has grave concerns regarding the Final EIS and believes it was issued prematurely. The EIS does not provide the data and needed analysis, but chooses a preferred alternative. Despite the indication of future studies associated with hydrology and wellfield protection, the document concludes with a preferred alternative. Audubon believes

additional hydrological modeling is needed to better understand the hydrology within and surrounding the Lakebelt area. Monitoring of the water quality should be maximized since the project is within the vicinity of the wellfields. Measures need to be taken to minimize potential for water within the Lakebelt to become contaminated. No industrial land use of land in or near the Lakebelt should be allowed and protective levees should be constructed around the Lakebelt area. Buffer zones should be established which should limit types of activities and/or facilities to occur in the area. Protection for the wellfields should be a requirement. Ecological buffers should also be used around the Lakebelt. An emergency response plan needs to be developed should contamination occur. Restrictions on the use and/or storage of hazardous and toxic materials should be in place. Since the acreage of the quarry pits is being used in the mitigation calculation, all quarry pits with littoral zones and the adjacent uplands need to be placed under a conservation easement. Lands within the Lakebelt boundary should be considered first for mitigation before looking to adjacent property. Prior to the issuance of any permits, a comprehensive mitigation plan should be developed. Littoral shelves should be designed with a 20:1 slope from the ground elevation waterward. Littoral shelves should be placed along the western edge of mining within the study area instead of along the edge of every quarry pit. These aggregated littoral shelves should be designed with an uneven edge to increase habitat diversity. Mitigation funds should not be used for the purchase of credit within a mitigation bank. Hydrologic mitigation should be required and should include deeding of all lands in the Lakebelt planning area for water resources management. No concern has been addressed for either Trail Glades Range or Thompson Park, both recreational facilities within the Lakebelt. Protection of existing archaeological should be met prior to the issuance of any permits to satisfy the requirements of NEPA. The EIS does not adequately address practicable alternatives to limestone mining. A permit can not be issued if there is a less environmentally damaging alternative. The land use section in the EIS needs to be expanded to address adjacent areas

including, but not limited to Everglades National Park and the WCA3B, the East Coast Buffer/Water Preserve Areas, and the Urban Development Boundary. Discussions in the EIS regarding socio-economics don't account for costs associated with the loss of valuable environmental lands or address impacts on quality of life, water resources, and other important socio-economic issues. Rock mining is credited with supporting growth; therefore, it should be criticized for the adverse effects of growth. Future development within the Lakebelt area will drain fiscal resources from eastern communities. The discussion of secondary and cumulative impacts as a result of the project, as a result of past actions, and future actions is insufficient.

(2) Mr. Lloyd Bell: By letter dated 16 July 2000, Mr. Bell does not believe that there are no practicable alternatives to mining in the Lakebelt. He takes issue with the portion the EIS regarding "rail-served deep water port facilities." He has purchased 67 acres call the Port of Fort Pierce and they have necessary rail connections and are expanding their rail to ship capabilities.

(3) Florida Biodiversity Project: By letter dated 17 July 2000, Florida Biodiversity Project submitted comments of the Final EIS. The Florida Biodiversity Project believes and is disappointed that the Final EIS is the basically the same as the draft EIS. The project would result in the destruction of approximately 16,000 acres of functional wetlands and could result in irreversible damage to the natural hydrology of the area, which includes Everglades National Park. Florida Biodiversity Project opposed the project and recommends the mitigation money be better utilized to purchase, restore, and manage the remaining wetlands. The Final EIS is inadequate and objects to the preferred alternative due to secondary, direct, and cumulative adverse impacts to wetlands and associated wildlife, inadequate mitigation, inadequate compliance with NEPA and the Clean Water Act, inconsistency with the restoration of the Everglades, and lack of an independent peer review. The plan is vague and nothing is guaranteed.

(4) Miami-Dade County Environmental Resources Management (DERM): By letter dated 21 July 2000, DERM commented on the final EIS. The final EIS is incomplete and provides inadequate information and guidance to access the environmental impacts associated with the mining projects. The "no action alternative" has not been adequately evaluated on how the alternative could work if the mitigation required was consistent with current mitigation requirements. Potential impacts from pathogenic contamination of the Northwest Wellfield has not been evaluated and the potential for microbiological degradation of water quality from warm-blooded animals, which could carry *Giardia* and *Cryptosporidium*, has been ignored. Cattle grazing is an allowable activity within the vicinity of the wellfield. Required littoral shelves would attract wildlife to the lakes. The recommendation in the EIS for DEP to monitor the wells on a regular basis to determine if drinking water has come under the influence of surface waters minimizes the concerns and would not stop any impact. DERM does not concern that "disease-related microbial contamination in the Lakebelt is minimal." It is a premature statement since the water within the Lakebelt was not included in the water quality evaluation. Current mitigation requirements do not compensate for impacts. Reviews of the mitigation should occur every 5 years and no mention was made as to how these reviews would be accomplished. A long-term mitigation plan is need and permits should only be issued for impacts that can be offset by mitigation already identified. The functional unit calculation would need to be redone if the lakes are to be larger than 1 square mile; no functional unit value would be assessed for any areas slated to be reservoirs under the Comprehensive Everglades Restoration Plan. The final EIS should require at a minimum the creation of 496 acres of littoral shelves to offset existing impacts. DEM recommends a supplement to the Final EIS be prepared to address the concerns identified prior to the issuance of any Department of the Army permits.

(5) Miami-Dade Water and Sewer Department: By letter dated 21 July 2000, provide their comments to the final EIS. Miami-Dade Water and Sewer Department owns and operated the Northwest Wellfield. The Final EIS does not provide reasonable assurances that the wellfield would be protected from contamination from surface water influences. Evaluation of water quality only included current conditions not changes that could take place once the lakes are excavated. The evaluation did not include microorganisms. A wellfield protection plan is being developed; since the plan is not finalized, it is premature to recommend a plan supporting mining where rock might be needed for the protection of the wellfield. Decisions regarding permit issuance need to wait on the master plan being finalized and the water quality and hydrologic impacts being evaluated. The EPA has a procedure to determine if water supplies have come under the influence of surface waters, but it is after-the-fact. The Lakebelt Plan needs to ensure the current ground water supply does not come under the influence of surface water. If the water supply does come under the influence of surface water, then the treatment plant process needs to be modified to provide additional filtration and disinfection; the cost for tease improvements is estimated to be $235 million. Miami-Dade Water and Sewer Department recommends a supplement final EIS be prepared to address the water quality issue prior to the issuance of any permits.

(6) EPA: By letter dated 20 September 2000, EPA stated any recond of decision based upon the Final EIS would be incomplete and premature. The decision should wait on the issuance of the Phase II Master Plan. Once the master plan is completed, the EPA recommends the Corps prepare a supplemental EIS to address any of the outstanding, unresolved issues, such as drinking water protection. Mitigation requirements need to be resolved prior to the issuance of permits. The criterion for reviewing permits needs to be established. Additional areas in Miami-Dade County for acquisition and restoration need to be accomplished. The EPA supports the concerns raised by Miami-Dade County regarding impacts to water supply. A supplemental

EIS should address drinking water issues associated with limestone mining in close proximity to the Northwest Wellfield. The EPA is concerned over impacts due to seepage.

f. Resolution of Concerns Pursuant to the Memorandum of Agreement (MOA):

(1) FWS: By letter dated 20 December 2001, the FWS notified the Corps it would not be requesting a higher-level review of the project. All unresolved concerns regarding the wood stork have been adequately resolved. The FWS continues to have concerns about the proposed mitigation and recommends the Corps require the applicants to develop mitigation sites prior to wetland impacts to alleviate temporal loss of functions and values. The FWS also recommend the mining companies transfer post-mining land to an appropriate public entity for long-term management and require the 47 acres of littoral shelf per section be combined to maximize habitat values. The FWS stands ready to assist in the development of littoral shelf designs and placement, and will participate in the 3-year review.

(2) EPA: By letter dated 7 February 2002, the EPA stated the agency would not elevate the request for authorization based upon language to be included in the permit instrument, established management plans for the Pennsuco area, and developed plans to address wellfield protection, wood stork research, littoral shelf design and management, and ground water seepage. The letter was signed by Mr. J.I. Palmer, Jr., Regional Administrator.

g. Response to the comments: The Corps provided the applicants with copies of comments received through their attorney. The applicants provided no formal response to the comments; however, frequent meetings were held with the applicants and/or their representatives to resolve concerns of the various commentors.

---

8. Alternatives. Companies have acquired property and mined limerock from open-pit quarries in the area now known as the Lake Belt since the 1950s under Miami-Dade County zoning and wetland permitting regulations. After passage of the Clean Water Act in 1972, the Corps began regulating the industry. It has issued a number of Department of the Army Permits authorizing the placement of fill related to the mining. Representatives of the mining companies approached Dade County, the State of Florida, and the U.S. Army Corps of Engineers (Corps) with the idea of coordinating permitting to: (1) excavate limerock to connect adjacent quarries (currently, the pits must stop short of the property lines); (2) utilize the resulting contiguous lake for public recreation; and (3) restore a large contiguous area of the Everglades known as the Pennsuco.

a. Avoidance:

(1) Recognition by Florida Legislature through Lake Belt Plan. The Florida Legislature created, in 1992, a committee of agency and industry representatives to develop a plan to coordinate permitting into the future. The committee's report in 1997 proposed that mining be concentrated toward the east and that the industry fund the acquisition and restoration of lands toward the west. The State Legislature accepted and adopted the report, including establishment of an assessment to fund the acquisition and restoration of lands to "provide for the mitigation of wetland resources lost to mining activities…" It also mandated continued work on several areas of concern. The committee's Phase II Report expanded on these concerns and listed follow-up tasks to reach resolution.

(2) Corps preparation of an Environmental Impact Statement (EIS). The Corps started preparation of an EIS on the plan at about the same time as the above committee was established. The Corps was an ad-hoc member of the State's Committee and participated in funding wildlife, water quality, and other studies.

(3) Alternatives described by the EIS.

(a) A “no action” alternative whereby there would be no change in the current case-by-case evaluation of permitting. This would maintain the status quo, but would not provide for any benefits that would be expected to result from coordinating the footprints of all the mines in the area. For example, evaluation of a total plan allows for the consideration of mining between the pits since aspects such as abandoning rights of way and leasing of government owned parcels could be more easily coordinated. Absent this, mining activities would expand into a larger area due to the less efficient footprint. Another benefit gained by not permitting on a case-by-case basis is the coordination of off-site compensatory mitigation into a single large parcel instead of a patchwork of onsite preserves, resulting again in a smaller footprint of mining and therefore a larger area of wetland impact.

(b) A "no action" alternative that revokes all existing permits without issuing any new permits. The disruption in operations would result in economic hardship for the industry as well as increased construction costs and services for the public. The nature of the industry demands that considerable capital investments be made in heavy equipment and processing plants. These investments often have depreciation schedules greater than the length of a typical Permit. The industry recognizes that Corps permits have expiration dates, and, barring a change in the Clean Water Act, there is an expectation of continued permitting. This is not to say the permits cannot be allowed to expire or revoked, but that the basis for the permit termination should be based on new information on environmental or other impacts that indicate mining would be contrary to the public interest or be illegal under other laws.

The State of Florida at 373.4149, Florida Statutes, adopted a map that describes areas of allowable mining, which states the impacts within those areas "…can best be offset by the

implementation of a comprehensive mitigation plan…" There are several areas where there is a risk of adverse effects, including wetland restoration opportunity to replace the wetland loss; the potential introduction of contaminants to the public wellfield; increased groundwater seepage; disturbance of archeological resources; and potential impacts to the Wood stork, an endangered species. Each of these is examined in more detail elsewhere in this memorandum along with a description of the actions taken to minimize the risks, provide compensation, and to provide for periodic reviews to incorporate new information.

While there is a possibility that adverse effects may occur despite the referenced measures, there may be a risk to the Government in denying landowners use of their property based upon such "possibilities." For example, the Corps denied Florida Rock a permit in 1980 to mine 98 acres of Pennsuco wetlands based on environmental and other concerns. Florida Rock owned 1,560 acres of wetlands but the Corps could then issue permits for only 3 years and determined that 98 acres could be mined in 3 years. The Fifth Amendment takings case was litigated for 19 years in the Federal courts and was settled in 2001 by the United States paying Florida Rock $21 million for the 1,560 acres, plus attorney fees and interest. The alternative to this costly process would be public acquisition of the lands. However, the Corps is not a land management agency and does not have the necessary congressional authorization or funding to acquire conservation lands.

In any case, public acquisition of the unmined lands would entail acquisition of the approximately 40 square miles of land owned by the mining industry, plus removal of the roads, railways, processing plants and other infrastructure. Also, to restore the marsh would require removal of drainage works, but that would require acquisition of the remaining 31 square miles of privately owned and 16 ½ miles publicly owned lands. This would be a very significant cost compared to the current proposal where a portion of the area will be acquired and

restored by the industry (with no public funds). One indication that this expense is not supported by public policy is that such acquisition was not included in the final report of the Comprehensive Review of the Central and Southern Florida Project.

(c) An alternative allowing mining only in existing permitted areas, with all future mining denied. This presumes renewing existing permits, most of which are expiring. However, this does not resolve the issues for the previous alternative and results in impacts outside of the Lake Belt. The EIS Appendix I provides an analysis of Non-Lake Belt Alternative Sources. Rock product is only available in limited portions of the State. Slightly over 40% of the rock used in Florida comes from the Lake Belt. Products include aggregate in concrete and asphalt, road base, and cement. In 1998, the total quantity of rock used in Florida amounted to approximately 8 tons per capita. Any change in the cost or availability will have wide repercussions across the State.

The Appendix describes the other alternative rock sites within and outside of Florida. The information describes deposits that occur in veins far narrower than those in the Lake Belt, therefore from 2.1 to 3.9 acres of land at the alternative location would have to be excavated for the same quantity of rock from 1 acre in the Lake Belt. Most of these locations include quality wetlands or habitats. Denying future permitting would avoid impact to generally low quality Everglades habitat but would result in the loss of high quality and regionally important habitat elsewhere. Some of these alternative sites also have poor potential for expansion due to urbanization or other concerns so their use could result in yet higher costs. Also, if rock mining operations were moved to the many smaller mines located throughout the State, there would be considerable cost to relocate the rail network, aggregate and cement plants, and trucking infrastructure that currently distributes the rock products from the Lake Belt. This dispersal would move the industry away from energy-efficient rail service, cause economic

and employment impact to Miami-Dade County, and would potentially include the loss of wetlands for construction of the replacement networks.

Whether mining in the Lake Belt stops when the existing footprints are mined out (this alternative), or in 20 or even 50 years, at some point, the public will need to review the total costs (ecological, economic, and social) of its current usages of rock products. Will it be willing to accept the accelerating costs or will it look for alternatives, alternative materials for road or building construction and/or more extensive recycling? The 50-year footprint reflects the industry's expectations of the quantity of rock the public will buy, and it forms the basis upon which they have been acquiring land, equipment, and constructing processing plants and other infrastructure. Ultimately, the public's need for the rock product will have to change and private industry will react, but it is not the role of the Corps to dictate to the public or to manage the State's economy.

(d) An alternative providing for comprehensive review of all planned mining activities for the area over the next 50 years to guide subsequent planning and regulatory actions. These actions include the 10-year mining permits that are the subject of this document, future permit modifications, review of applications for permits to authorize mining after 10 years, and the proposed pilot and construction projects for the Comprehensive Everglades Restoration Project (CERP). This alternative allows coordination of the footprints of the incremental actions so as not to conflict with other incremental actions. For example, one constraint on the location of the 10-year mining footprint is to avoid an area that may be required for implementation of CERP so that mining would not take place until completion of the CERP planning and authorization process. This also allows for coordination of compensatory mitigation. For example, previous mining permits generally located mitigation completely on-site, but then subsequent mining permits would result in fragmentation of the wetlands. As a

result of the comprehensive review, a location (the Pennsuco) is expected to remain free of mining over fifty years and therefore can be incorporated into the 10-year permits for compensatory mitigation with some assurance that it will not be subsequently fragmented. The 10-year permits that are the subject of this memorandum incorporate mining footprints that are a subset of the total 50-year footprint developed in the alternative analysis found in Appendix F of the EIS.

A team established by the Working Group for the Restoration of the South Florida Ecosystem prepared this analysis. Attendees included representatives of the mining industry, environmental non-governmental organizations, and Federal, State, and Local agencies. The analysis process considered many alternative maps prepared by the attendees, each map designed to avoid impacts to one or more environmental, economic, and other concerns. Each map was evaluated using a scoring system developed and performed by the attendees. The result was a Consensus Map that provides for mining in a compact footprint to the east and preservation of a contiguous block of wetlands to the west. Interestingly, the area of the mining footprint is smaller than the acres of land owned by the mining industry (that presumably was acquired for mining) and adoption of the footprint requires some of the companies to acquire additional land to mine. The Consensus Map is also very similar to the one developed independently (but without the formal preparation of alternative maps and scoring) by the Lake Belt Plan Committee. Their map was adopted by the State legislature, on the provision the mining footprint is consistent with public policy. Based on these two processes, the footprint of the mining in these 50-year maps provides the appropriate level of avoidance of environmental impacts while fulfilling the project purpose of mining. The 10-year footprint is a subset of the larger footprint and therefore provides an appropriate level of avoidance. (Indeed, since there is only 10 years of mining, the quantity of environmental impact is considerably less.) The 10-year life of the permits allows for a review of the overall plan based on actual experience and new information.

b. Minimization:

(1) Groundwater Seepage. Groundwater flows east from Water Conservation Area 3B (WCA3B)(north of Tamiami Trail) and from the Everglades National Park (ENP) (south of Tamiami Trail). The eastward flow is generally driven by the higher water levels in WCA3B and ENP compared to the areas to the east, where lower water levels are maintained by drainage canals. Sections 3.8 and 6.1 of the EIS summarize the results of several hydrologic modeling evaluations of the changes from increased mining. The evaluations are found in Appendix A of the EIS. A subsequent model evaluation is reported in the Miami-Dade County Lake Belt Plan Implementation Committee Phase II Plan report. In general, the excavation of the lakes removes highly porous limestone and leaves only water water in its place, reducing the resistance to groundwater flow out of WCA3B/ENP. If no additional water is provided to WCA3B/ENP from the regional system (such as from Lake Okeechobee) then the above ground hydro-pattern in the marsh could be reduced.

The mining south of Tamiami Trail is located immediately east of and within an approximately 5 mile stretch of the L-31N canal. To the east is Everglades National Park and to the west is (moving from north to south starting at Tamiami Trail): Krome Detention Center (the first mile), a privately owned undeveloped site (1 mile), proposed mining (2 miles), and existing mining (1 mile). The mining that is the subject of this document is a strip 1,000 feet wide by 2 miles long located between 1,000 and 2,000 feet from L-31N. Mining is currently authorized between the existing pit (approximately 3,400 feet from L-31N) and 2,000 feet from L-31N. The L-31N canal is part of the South Dade Conveyance System that allows for the transfer of water from the north (including Lake Okeechobee) to the southeast corner of ENP. During the wet season, a large portion of the ground water flowing east out of ENP is intercepted by the canal and is sent

south. During the dry season, water flows out of the canal and joins the groundwater flow to the east.

(a) The first evaluation in Appendix A is a regional model based on a 2 mile by 2 mile grid. Six scenarios were modeled and twelve numeric measures of success reported. Four scenarios use the "1990 base conditions" of the Lower East Coast Water Supply Plan, each scenario varying the acres of mining. Two scenarios use the "2010 base condition" which includes the associated land use and associated public water supply and irrigation demands (including wellfield pumpage), factors outside the control of the miner. Four of the measures of success are shown on the following table for the 1990 scenarios:

Scenario	1	2	3A	4A
Acres of Mining	zero	5,120	10,240	25,600
Total Seepage from WCA3B during 1969 (wet). 1,000 acre-feet.	292	295	299	312
Total Seepage from WCA3B during 1989 (dry). 1,000 acre-feet.	81	85	91	128
Average depth of ponding in Pennsuco wetlands. Feet.	1.11	1.09	1.01	0.87
Duration (% of time) of ponding.	76%	73%	71%	52%

The acres for Scenario 2 comprise the approximate acres of existing mines in 1994 (the land cover map use for the EIS) and Scenario 3A is approximately the total acres of the "10-year" footprint authorized by this permit. The total 50-year footprint is approximately 19,600 acres, somewhat more than halfway between Scenario 3A and 4A. The effect is non-linear, the per-year change in the early years (from 2 to 3A) is less then in the subsequent years. This is a result of the early mining generally taking place further to the east (away from the WCA3B) and subsequent mining taking place closer to the WCA3B. Also, in the early years, the change is also small, for example, the seepage in the wet year (1969) increased by 4,000 acre-feet, or 1.3% of the total.

(b) The second evaluation in Appendix A used a 1,000 foot by 1,000 foot grid. Eight scenarios were modeled and seepage reported for various rates of Million Gallons per Day (MGD) from the wellfield and ponding depths at different locations within the Pennsuco. The following table shows five of the scenarios, four of which are roughly equivalent to those of the earlier modeling and an additional (Scenario 6) reflecting approximately the acres of the total 50-year footprint (however, the footprint modeled is somewhat different in configuration.) This table is based on the Northwest Wellfield 1989 average pumpage rate of 155 Million Gallons per Day (MGD). For ponding, 22 grid locations within the Pennsuco were reported. Six of these are shown in the table below, reflecting locations within the Pennsuco for 1969 conditions. The model reported the water table located below ground surface for the entire 1989 dry hydrologic condition.

Scenario	1	2	3	6	5
Acres of Mining	zero	4,870	12,449	20,424	26,614
Seepage from WCA3B 1969 (wet) 1,000ac-ft	242	242	246	245	273
Seepage from WCA3B 1989 (dry) 1,000ac-ft	196	193	194	192	209
Days of Ponding (1969)					
NorthLevee(Row 75 Col 70)	156	180	147	156	13
NorthEast(Row 75 Col 68)	201	201	201	201	137
NorthWest(Row 75 Col 64)	272	278	278	284	247
CenterLevee(Row 85 Col 70)	67	105	90	91	20
CenterEast (Row 85 Col 68)	201	201	201	201	141
CenterWest(Row 85 Col 64)	260	268	269	272	249

With a 1,000 foot grid, the distance between Columns 68 and 70 is small yet there is a large difference in ponding depths, indicating that not all of the Pennsuco is equally affected by the change in seepage, and generally the greater change will be to the eastern part of the Pennsuco as the mining over time moves west drawing closer to the Pennsuco. A review of the change of seepage figures between scenarios generally confirms

the observation made based on the earlier table that the incremental effect in early years will be less then in later years.

This evaluation also included estimates of the change in seepage from ENP. However, the future condition assumed by the model is mining out the entire area along approximately 4 miles of the L-31N canal, instead of the proposed1,000 foot by 2 mile strip. The seepage increases from approximately 155,000 acre-feet per year to 210,000 acre feet per year in the wet season and from 60,000 to 90,000 acre feet per year in the dry season (figures scaled from the graph).

(c) The third evaluation in Appendix A uses the same grid of 1,000 feet by 1,000 feet but includes scenarios of construction of several new water control structures. These structures were proposed by the mining industry (described by the fourth and fifth evaluation reports in Appendix A) to demonstrate a minimization action that could mitigate the effects of the seepage. The structures increase the stage of the water in various canals to create a barrier to groundwater movement. This would avoid the seepage loss and thereby the change in ponding durations. The scenarios modeled were: current permitted configuration (this would be the existing lakes, approximately 4,921 acres, plus the areas previously permitted but not yet mined, approximately 4,623 acres, or similar to Scenario 3A of the first analysis in Appendix A); proposed (50 years) mining configuration without the water control structures, and the proposed configuration with structures. Instead of tables the report provided colored maps showing changes in ponding depths. The report narrative states

"In addition, figures 9 and 11 show that the increased mining, either with or without structural improvements, has little impact on ponded water levels under the dry 1989 hydrologic conditions since virtually no ponded water exists under these conditions for any of the scenarios. Figure 8 [comparing the 50-year plan without structures to the current permitted

footprint] clearly shows a reduction in ponded water depths near the central Pennsuco wetlands. Figure 12 [comparing 50 year plan with and without structures] show that the structural improvements may significantly increase ponding depths within the southern Pennsuco. Lesser increases in ponding depth also occur in areas of WCA-3B and the Everglades National Park."

However, the report also describes changes to the flows in the various canals resulting from by added structures. In general, as mining increases there is increased flow of groundwater from aquifer into the canals but after installation of the structures in some of the canals there is a reversal of flow where, due to the higher stage, water flows from the canal to the aquifer. Looking at the resulting groundwater flows, the report states "that increased seepage rates from WCA-3B will be small under the proposed mining scenario and will decrease approximately 20 per cent if the structures are added. Similar effects on WCA-3B can be seen under dry annual hydrologic conditions." However, both the ponding depth changes and the seepage changes are possible only if the proposed stages are maintained by the new structures, which will require additional water to be supplied from the regional system.

For the mining south of Tamiami Trail, the assessment compared the difference between the existing edge of mining (approximately 3,400 feet from the canal) and the currently permitted footprint (2,000 feet). Since the model uses a 1,000-foot grid, an examination of the grid cell overlay in Figure 2 of the report appears to indicate that distances of approximately one grid cell (1,000 feet) and three (3,000 feet) may have been used. Although this is not exactly the proposed mining between 1,000 feet and 2,000 feet, the trends predicted can be interpolated. The report narrative does not describe the change in ponding depths resulting from the difference in mining but the cells in Figure 8 (for the 1969 wet year) are colored "-0.1 to 0.1 ft Difference in Ponding Depth." When discussing the water budget for the L-31N canal, the narrative describes that additional water drains from the canal eastward as mining is

increased which will either reduce the amount of water delivered downstream of L-31N or will "…require additional water from the regional system be supplied…" The model also assessed the change with a proposed water control structure that would increase the stage in the canal. The ponding depths increase as a result but this increases the water flowing from the canal into the ground, so additional water from the regional system would have to be supplied to both maintain deliveries to the south and to maintain the stage.

(d) The fourth evaluation found in Appendix A of the EIS was performed by an industry consultant using the same model. Here, the assessment has three scenarios: the existing lake; mining to 2,000 feet of the L-31N, and 1,500 feet from the L31N. There are no tables in the report but bar charts show the change in flows. Figures given here are from scaling from these charts for the purpose of describing orders of magnitude. There is very little increase in seepage from ENP in the wet season (barely discernable difference in approximately 1,250 acre-feet per day) and a small increase in seepage during the dry season (on the order of 2 to 3% of approximately 210 acre-feet per day.)

(e) The fifth evaluation found in Appendix A of the EIS was performed by an industry consultant and compares: the difference between the existing edge of mining; the existing permit (2,000 feet from the canal); and mining the entire tract. The model run used a new Calibration Data Set. This reflects that the information used in all the hydrologic models, such as the groundwater conductance values, has and is expected to continue to evolve and improve over time. The consultant provided a sensitivity analysis and, in general, notes that while the calculated results change the relative trends do not change. The following figures are extracted from the table in the report labeled "Steady State Seepage for the 1969 Wet Season":

Scenario	"Seepage through L-31N"				"Leakage from L-31N"	
	ac-ft/wk	cfs	change in cfs		ac-ft/wk	cfs
Existing	3,280	236	- 2	- 0.76%	-1,922	-138
Permitted	3,304	238	0	0%	-1,817	-131
All Site	3,366	242	+ 4	+ 1.86%	-1,579	-114
+Structure	3,054	220	-18	- 7.57%	-1,071	- 77

The following are for "Steady State Seepage for the 1989 Dry Season."

Scenario	"Seepage through L-31N"				"Leakage from L-31N"	
	ac-ft/wk	cfs	change in cfs		ac-ft/wk	cfs
Existing	379	27	- 2	- 5.48%	491	71
Permitted	401	29	0	0%	1,083	78
All Site	444	32	+ 3	10.82%	1,276	92
+Structure	356	26	- 3	-11.20%	1,423	103

Similar to the results of the model described earlier, there is a small increase in seepage from ENP, but a greater increase in leakage out of the canal during dry season. The proposed structure overcompensates for the seepage but the resulting increased leakage would require additional water being delivered from the regional supply.

(f) During preparation of the Phase II report, additional model runs were performed by SFWMD for the Lake Belt Plan Implementation Committee. Five scenarios were modeled: 95Base (existing mines), 50Base (current permits mined out), 50Mine (50-year footprint mined out), Scenario 1 (50 years minus a portion of the FP&L lands immediately east of the Pennsuco) and Scenario 2. The Phase II report states:

Modeling done to date represents various mining configurations without the additional of measures to mitigate any hydrologic impacts or CERP components. Preliminary findings indicate that for the alternatives studied mining will have the greatest impact on the eastern Pennsuco Wetlands. The western Pennsuco

Wetlands will be less affected. The hydroperiod for the east central Pennsuco will be shorter relative to other areas of the Pennsuco Wetlands.

This is based on a set of graphs and tables posted on the SFWMD web page referenced in the Phase II report. For example, the following are figures extracted from the graphs showing the weekly Ground Water Stage Duration Curves for the period of record 1998 to 1995, the figures reporting the percent of the year the location is flooded.

Indicator Cell	95Base	50Base	Scenario1	50Mine
Pennsuco Northeast	18%	26%	18%	7%
Pennsuco Northwest	58%	56%	55%	53%
Pennsuco Centrleast	26%	37%	27%	15%
Pennsuco Centrlwest	62%	62%	61%	56%
Pennsuco Southeast	9%	13%	12%	5%
Pennsuco Southwest	64%	66%	65%	63%
Everglades NP East	65%	67%	66%	66%

Again, similar to the early modeling assessments described above, between the 95Base and the 50Base also includes an increase in wellfield pumpage since that is how these are defined in the development of the alternatives for the Comprehensive Restudy EIS. The second of the modeling assessments found in Appendix A of the EIS included figures for different pumpage rates and reported increase pumpage increased seepage (although the effect on water levels in the Pennsuco were also affected by the Northwest Wellfield Supply Canal.) In general, though, the trends shown in this modeling are not dissimilar to those of the earlier ones.

(g) The enclosed figures for Appendix A4 of the Comprehensive Restudy EIS illustrates the multiple components proposed to be constructed within the Lake Belt. The design of these components will be refined over the next many years. Briefly, these are as follows along with the estimated dates as published on the CERP Web site. Component BB, Dade-Broward

Levee/Pennsuco, improves this levee and canal along the east boundary of the Pennsuco to reduce seepage from the Pennsuco wetlands and WCA-3B and to enhance recharge to the wellfield. Component U, Bird Drive Recharge Area, constructs an impoundment to capture water from C-4 basin to recharge groundwater and reduce seepage from Everglades National Park and also to act as a conveyance to supply water to the south. These two components are part of the recently released (for comment) Draft Water Preserve Area (WPA) Feasibility Study and are shown in the enclosed figures from Appendix A1 of that report. The project's End Date is 2014.

The improvements to the Dade-Broward Levee canal include maintaining the stage in the canal to provide seepage control, similar in concept to the miners' plan to provide seepage control. The component map in the Draft Study also includes a 1/2-mile buffer along the east of the levee, in lands currently in the 50-year mining plan but not within the currently proposed 10-year footprint. Components V and FF, Everglades National Park Seepage Management Project, relocate the L-31N levee and canal toward the east, construct a levee cutoff wall, and add pumps to reduce groundwater seepage from the Park and improve water deliveries. The L-31 Seepage Management Pilot Project End Date is in 2006 and the total project End Date is 2013.

The miners' plan for seepage control included a structure on the L-31N canal to raise the stage, however, the CERP proposal will fill in the canal (on the west side of the mine) and build a seepage cutoff wall on the east side of the mine. The mined-lake and remaining wetlands would then be flooded as they are downstream of the proposed discharge pump into Everglades National park.

Components S and XX, the Central and North Lake Belt Storage Areas, construct levees and seepage barriers around mined-out lakes to impound water captured from runoff from several of the basins in the vicinity. The Lake Belt In ground Reservoir Technology Pilot Project End Date is in 2006 and the total

project End Date is 2036. These reservoirs are in general increasing the regional water supply and could also affect seepage but the primary relationship to the proposed mining is that these mined-lakes are the default locations for the miner-constructed littoral marshes as part of the wetland compensatory mitigation plan.

(h) The hydrologic interrelationship between CERP and the mining described in the previous paragraph was explored by a memorandum posted on the same SFWMD web page as the Lake Belt Phase II modeling results described in paragraph (f). This memorandum used the regional model (based on a grid of 2 mile by 2 mile) to simulate the increase in area of mining over that used for preparation of the Comprehensive Restudy EIS. Four scenarios were modeled: 50BSR (only the existing permits mined out), AD13R (50BSR plus the storage reservoirs for the Lake Belt area), 50LB (50BSR plus the additional mining representing the 50 year plan), and AD13RLB (50LB plus the storage reservoirs). In its conclusion, the memorandum reports that the net increase in subsurface flow from WCA3B and Pennsuco increased by 18 percent as the result of the increased area of mining when there were no reservoirs (between 50BSR and 50LB) and increased by 34 percent with the reservoirs in place (between AD13R and AD13RLB), reducing the "…hydroperiods by 1 percent to 3 percent for WCA3B, and by 13 percent to 19 percent for Pennsuco." The 2-mile model grid divides the Lake Belt landscape into cells of 2,560 acres each. Five cells (12,800 acres) are identified as deep lake under 50BSR and ten (25,600 acres) under 50LB. The acres are greater than the estimated total acres of lake when the 10-year permit footprint is mined out (10,138 acres) and the 50-year plan (18,912 acres). In comparison, the modeling used for the Lake Belt Phase II report (described in paragraph (f) above) has a scenario labeled 50BASE which includes the same definition of the extent of mining as 50BSR (completion of existing permits). This can in turn be compared to the modeling analysis for the Draft Water Preserve Area (WPA) Feasibility Study posted on the WPA web page. Its scenario labeled 50BASEASR also references the completion of

existing mining permits. The following table arrays the results of these three models for an indicator region (a cell or cells) in Northern Pennsuco, reporting the average annual hydroperiod (percent of the year the location is flooded). This parameter is just one of many available in the reports, but is used here since it is an important attribute of wetland function.

	95BASE	50BASE	50MINE		
Phase II Report	37%	44%	26%		
		50BSR	50LB	AD13R	ADBRLB
CERP Memorandum		79%	64%	96%	77%
	95BASE	50BASEASR		WPATSP	
WPA Draft	37%	44%		52%	

These modeling results each have their own set of assumptions and so the absolute numbers are less important then the trend. The results also vary by location (that is, these don't apply to the entire Pennsuco.) The first set show, as discussed above, that increased mining has an effect on the hydropattern, the effect resulting from mining-out the existing permits is less then the effect of the subsequent expansion to the 50-year footprint. The second set starts at the point the existing permits are mined-out and shows a downward trend when mine the 50-year footprint (from 79 percent to 64 percent), a relatively large upward trend from the CERP if the industry stopped mining at the end of the existing permits (from 79 percent to 96 percent) and a smaller upward trend if CERP has to be built with the industry's 50-year plan mined-out (from 64 percent to 77 percent). The third set is based on a more refined design of the CERP components and still shows the expected upward trend based on mining stopping at the current permits (from 44 percent to 52 percent). As described in paragraphs (c) through (e) above, the results of the modeling of the industry conceptual plan to install control structures shows that this is one way that could be implemented to prevent the downward trend.

(i) In conclusion, there are groundwater seepage impacts, and the permit instrument is conditioned to recognize the miners' obligation to avoid and compensate for their impacts. North of Tamiami Trail, the effect is proportionally small, whether one is measuring total groundwater seepage or the percentage of the total area whose hydro-pattern is reduced. The effect reported is for a fifty year quantity of mining, and the annual effect is small in early years but incrementally increases as mining moves to the west. South of Tamiami Trail, the effect on hydropatterns within ENP is minimal despite the increase in groundwater seepage. During dry seasons, maintaining deliveries of water to the south would, because of the increased leakage from L-31N canal, require additional water from the regional system with or without the proposed structure, but the proposed structure reduces the seepage from ENP. As described above, the CERP project may result in a seepage barrier constructed to the east of the mining and therefore revision, incorporation, or other such coordination of the miner's design with the larger project may remove the need for additional water from the regional system. For north of Tamiami Trail, the miners have described how the seepage could be avoided through addition of structures but these would require additional water from the regional system. The design and location of these are also affected by and could be improved by coordination the ongoing CERP project development.

The need for additional water from the regional system is a difficult issue for the Corps acting under Section 404 of the Clean Water Act to address since the Clean Water Act reserves water supply aspects to the States. This issue is certainly recognized by the State and must be incorporated by the State in its water supply planning. Both resolution of this issue and the design of seepage avoidance/compensatory actions is best done in conjunction with CERP components related to seepage, which as seen above have complete dates of 2013 and 2014.

South of Tamiami Trail, the Permittee is also contributing a one cent fee per ton of material mined between 2,000 and 2,700 feet from L-31N designed to fund the structure modeled by the industry consultant. The L-31 Seepage Pilot Project is expected to provide a revised hydrologic model and evaluation of seepage technologies by late 2003 that would be available for any re-review of the proposed mining and seepage control. In addition, the Permittee has agreed not to mine closer then 2,000 feet before June 2004 to allow time for the Corps to refine the seepage analysis and for purchase of the area within 2,000 feet if determined necessary for a public purpose. If the new information indicates that potential impacts are more than minimal or if they are not mitigatable, the Corps could reevaluate the Permit under the suspension provisions of the Corps Permit regulations. If problems are discovered after June 2004 during subsequent development of the CERP project design there is still opportunity for the government to expedite acquisition of the property.

The information available at this time suggests that the impacts would be minimal and seepage control technology would mitigate. Upfront seepage mitigation for the final anticipated seepage impacts of the project is not immediately required due to the fact that the mining proceeds from east to west at a relatively slow rate affecting only a few acres each year and the CERP projects are scheduled in these early years. Therefore, the permit instruments for all of the companies in the Lake Belt require the timing of the submission of the total plan for hydrologic seepage control to be discussed at the periodic reviews and not later then the 10-year review of the permit.

(2) Wellfield. The Northwest Wellfield is located within the Lake Belt Area and under the 50 year plan will be surrounded on three sides by mining (mining exists now on two sides) and by urban development to the east. The West Wellfield is located immediately east of the mining south of Tamiami Trail. These provide drinking water to northern Miami-Dade County. Ordinances at Chapter 24-12.1, Code of Miami-Dade

County, provide specific wellfield protection rules, including a prohibition of mining within a setback distance from the wellheads. The setback is no mining within the 30 day travel time boundary (the number of days for a pollutant to reach the well) and a limit of 40 foot excavation depth between the 30 and 210 day travel times, or, if excavation deeper then 40 feet, then maintenance of an unexcavated buffer for a total of 60 day travel time. The 60 day travel time has not been delineated on an official map or codified but has been estimated as approximately ½ mile. However, the rule was developed based on protection from hazardous materials spills and generalized survival times of bacteria and viruses such as from septic tanks. However, some microorganisms such as Cryptosporidium and Giardia can survive for months. Also, the newer hydrologic modeling is increasing knowledge of the travel times at different depths of the aquifer. Miami-Dade County staff is currently reviewing a draft risk assessment analysis and, along with other information, is considering whether to recommend to the Board of County Commissioners to modify the current ordinance so to provide a new setback distance or other restrictions. The wellfields are currently NOT classified as "groundwater under the direct influence of surface water" (GWUDI) but the current suite of setbacks and restrictions may not be providing the appropriate level of protection to prevent surface water contaminants from reaching the wells. If the wellfield is reclassified to GWUDI existing water treatment plants would have to be upgraded. This issue was identified during the preparation of the EIS and also to the Legislature in the 1997 Lake Belt Plan Phase I report. The Legislature directed the Lake Belt Plan Implementation Committee to continue work on this. The Phase II report describes that the County prepared a plan to assess the setback boundaries and that the next steps anticipate the risk assessment study by 2002 and that the Miami-Dade County Code be amended in 2003. Therefore, interim restrictions were negotiated between the Permittees, Miami-Dade County, FDEP, and the U.S. EPA. First, the applicants closest to the wellfields minimized the total mined acreage nearest to the wellfields for the first 3 years by

relocating, where possible, operations away from the wellfield. Second, certain areas within the 10-year footprint near the wellfield cannot be mined unless authorized by a permit modification three years after issuance. Third, the Permittees undertake a set of onsite best management practices to control source of contamination. Fourth, the Permittees will perform water quality monitoring as an early-warning for potential contamination and to assist in the County evaluation. This minimizes the potential for impact to the public health while the risk assessment and amendment of the ordinance are being reviewed.

c. Project As Proposed: The 50-year total plan concentrates mining in the eastern portion of the study area and leaves the western portion (the "Pennsuco") adjacent to Water Conservation 3B (WCA-3B) free of mining. The 10-year permit footprint is a subset of the 50-year total and locations of mining are further adjusted to move mining as far from the wellfield as possible.

d. Conclusions of Alternatives Analysis: The proposed 10-year mining footprint is the least damaging to the aquatic ecosystem in that it is much smaller than the 50-year total plan (which itself minimizes impact to wetlands compared to other alternatives described in the fifty year analysis) and is generally in the poorer quality wetland areas. There is an expectation of an increased groundwater seepage that will affect wetland hydro-patterns, but the mining in the 10 years is the farthest away from the Pennsuco and so the effect is less in these early years. Also, the 10-year permit allows time to coordinate the construction of seepage management systems with the CERP. There is a risk of contamination to the public wellfield but additional interim restrictions are imposed on the mining and a review is scheduled three years after permit issuance to minimize the potential that the adverse effect will occur.

---

9. Evaluation of the 404(b)(1) Guidelines:

a. Factual determinations:

(1) Physical substrate: Soil is predominately organic muck typical of Everglades marsh but has been drained. The muck overlies limestone bedrock. The overburden is moved and stockpiled on other areas of muck. The rock is excavated down to a depth of 80 feet by blasting and removed by drag lines, which temporarily windrow the rock on workpads. Workpads and haul roads are limerock material placed on the muck or exposed limerock. After excavation, muck is placed back on the 100-foot-wide limestone shelf left after excavation. Upon completion of the mining activities, there is a total conversion of the physical substrate from a wetland to a deep lake with a 100-foot littoral shelf along its perimeter.

(2) Water circulation, fluctuation, and salinity: The Lake Belt Area is not tidal nor a riverine system thus it does not have circulation nor salinity issues. Surface water fluctuation is from rainfall and from groundwater flowing from the east. Subsurface water moves through the very porous limestone rock. The project changes a wetland with standing water to open quarry lakes. The resulting lakes will have direct connection to the aquifer. Because the ground water is fairly close to the surface the water levels in the lakes is close to the surface. The littoral shelves are designed to have sufficient inundation to support obligate wetland plants. Surrounding flood control features largely controls the water levels. There is increased quantity of groundwater flow that reduces the depth and duration of flooding in adjacent wetlands. As described elsewhere in this memorandum, the change in flow is small compared to the total and is small in the first ten years compared to the total fifty years of expected mining. Construction of water control structures could avoid this effect but the design and timing will be coordinated with the CERP design and timing.

(3) Suspended particulate/turbidity: Temporary and localized impacts may result from removal and stockpiling of the overburden, but this is typically performed during the dry season. The project converts wetlands with their characteristic level of particulate/turbidity to quarry lakes with their own characteristics. There is turbidity in the lakes during the blasting and mining operation but during construction the lakes are isolated from other surface water by perimeter berms. Current State DEP requirements are that the berm remain after the lakes are mined, but Miami-Dade County is concerned the berms may give access to the wellfields and does not want the berms. (the County and State are currently discussing this. If the county prevails the miners will have to seek a waiver from the DEP.) The chief source of particulate or turbidity contamination would be from runoff from surrounding land uses; the berms and littoral shelf buffer zones will provide protection from the runoff. In the lakes themselves, the calcite precipitate from the limnological process will form suspended solids, which, however, provide beneficial effects in maintaining water quality. This is described at Section 6.2.1.1 of the EIS and Appendix B.

(4) Contaminant availability: Neither the deposit of the muck during its removal or placement on the littoral shelf, nor the placement of the excavated limerock as workpads or temporary windrows will introduce contaminants since these materials were removed from the same location. As described by Section 6.2.1 of the EIS (based on the Water Quality analysis of Appendix B), there are no factors, such as borrow pit morphology, mining or reclamation practices that would cause an adverse water quality impact. There is a potential for introduction of contaminants from accidental spills during mining operations or from runoff from workpads or other adjacent land uses. This will be controlled by a perimeter berm and buffered by the littoral shelves. As described elsewhere in this memorandum, this is of particular concern where the mining is near the wellfield. While there is a current Miami-Dade County ordinance providing many restrictions to on-going mining,

the permits include additional interim restrictions on operations and also provide monitoring for the next three years while Miami-Dade County considers revising its ordinance based on on-going risk assessments and other studies.

(5) Aquatic ecosystem effects: Project will convert wetlands to large fresh water lakes with perimeter littoral wetlands. The wildlife and habitat impacts, further described at Sections 6.4 through 6.5 of the EIS, include, but are not limited to foraging for wading birds. The littoral wetlands will provide some replacement for this.

(6) Proposed disposal site: The placement of fill will occur immediately adjacent to the location from which it is excavated. Material is not expected to migrate from its location of placement since disposal is made during the dry season. Even if standing water is present there is no flow. Since the fill is either muck or limerock, surface runoff into the adjoining lands will not add contaminants different from existing contaminants. The lands are privately owned and are not designated for public preserve purposes nor are there other commercial or public recreational uses. Some of the disposal will be in the vicinity of public wellfields but outside of the limits established by county ordinance; nevertheless, additional restrictions are placed on mining operations.

(7) Cumulative effects: The Lake Belt study area is approximately 57,500 acres. Approximately 46 percent of the area is owned by the miners, 19 percent by various government entities, and the remaining 35 percent by private owners. Existing quarry lakes measure slightly less then 5,000 acres (9 percent) and under the 50-year plan, an additional 15,000 acres of wetlands are impacted (approximately 28 percent). The miners' land that is not mined (approximately 9 percent) includes lands in the Pennsuco that will be sold for wetland restoration. Some of the private lands are drained wetlands and others are existing agricultural or other uses. Miami-Dade County authorized land uses are rural residences, agricultural,

and limited other uses. The permits authorize a 10-year footprint but the EIS and this memorandum also describe the 50-year effect.

(8) Secondary effects: Secondary effects of the authorized placement of the fill are those resulting from the excavation of the lakes and from the use of the material mined. As described above, the excavation of the lakes replaces the porous limestone with water, increasing groundwater flows that could reduce the hydro-patterns of adjacent wetlands unless the appropriate seepage controls are constructed. The removal of the rock and muck increase the potential that contaminants from runoff could enter the aquifer and reach the public wellfield. Additional restrictions have been provided to reduce that risk. The mined material is processed into cement, crushed rock, and fill products that are used for construction throughout the State. Some of this could be used as fill in wetlands but these uses are regulated individually through 404 permits.

b. Restrictions on discharges:

(1) Alternatives (See paragraph 8):

(a) The activity is located in a special aquatic site (wetlands, sanctuaries and refuges, mudflats, vegetated shallows, coral reefs, riffle and pool complexes, etc.)
yes(XX) no( )

(b) The activity needs to be located in a special aquatic site to fulfill its basic purpose.
yes(XX) no( )

(c) It has been demonstrated in paragraph 8 above that there are no practicable nor less damaging alternatives which would satisfy the project's overall purpose.
yes(XX) no( )

(d) The least damaging alternative has no other significant environmental effects. yes(XX) no( )

(2) Other program requirements:

(a) The proposed activity violates applicable State water quality standards or Section 307 prohibitions or effluent standards. yes( ) no(XX)

(b) The proposed activity jeopardizes the continued existence of federally listed threatened or endangered species or affects their critical habitat. yes( ) no(XX)

(c) The proposed activity violates the requirements of a federally designated marine sanctuary. yes( ) no(XX)

(3) The activity will cause or contribute to significant degradation of waters of the United States, including adverse effects on human health; life stages of aquatic organisms; ecosystem diversity, productivity and stability; and recreational, esthetic, and economic values. yes( ) no(XX)

(4) Minimization of adverse effects:

(a) Appropriate and practicable steps have been taken to minimize potential adverse impacts of the discharge on the aquatic ecosystem. yes(XX) no( )

(b) Compensatory mitigation: The quantity and location of the mining actually performed is based on market demand of the product and the success of any individual company in the Miami-Dade Lake Belt to sell the product in competition with each other and with others. Therefore, the compensation plan is designed so that the quantity of restoration is scaled to the quantity of mining actually performed.

(i) Compensation for the ecological impacts to the wetlands associated with land clearing activities will be provided by acquiring, restoring and managing lands within the Pennsuco and other locations. Section 373.41492, Florida Statutes, establishes a per-ton-mitigation fee (Fee) on limerock and sand sold from properties within the Miami-Dade County Lake Belt (the area is more specifically described in the Statute). The Statute states:

The proceeds of the mitigation fee must be used to conduct mitigation activities that are appropriate to offset the loss of the value and functions of wetlands in the Lake Belt area as a result of mining activities and must be used in a manner consistent with the recommendations contained in the reports submitted to the Legislature by the Lake Belt Plan Implementation Committee, and adopted under section 373.4149, F.S.

The collection of the Fee started on October 1, 1999, at five cents per ton and is increased each year by 2.1 percent plus a weighted average of the Department of Labor's Employment Cost Index and Producer Price Index. An interagency committee must approve expenditures of the fee. The per-ton basis of the fee provides an automatic adjustment of the quantity of compensatory mitigation to the actual rate of mining, which is based on market demand. The cost growth indexing provides for the expected increase in the value of the land and increases in the cost of labor and materials to perform the restoration. The five cents per ton was calculated using an industry-provided projection of the total quantity of mining for each of fifty years, the subtotal quantity of "new" mining that would occur beyond the extent of mining authorized by current permits, and the cost of wetlands required to be acquired and restored.

An interagency group (who prepared a narrative Lake Belt Mitigation Proposal) established the quantity of wetlands in 1996 as 2.5 acres of restoration for every 1 acre of impact. The costs of restoration are based on the South Florida Water

Management District (SFWMD) estimate that includes costs for acquisition of land, administrative costs, and restoration costs (Schedule of Mitigation Costs). The land acquisition cost is based on the purchases by the SFWMD (Actual Land Purchases). The restoration costs are based on SFWMD estimate for the initial and follow-up removal of melaleuca. The resulting cash flow analysis is described by Table A (Mitigation Fee Plan, enclosed) that shows an estimated $334 million collected from 13,994 acres of mining and $363 million spent to acquire and restore 23,425.8 acres. As seen in the table, in the early years, the Fee collected will exceed planned expenditures so the interest earned will cover the approximately $28 million shortfall.

The 2.5:1 ratio and the acquisition and restoration costs are based on the area known as the Pennsuco. Note that the 2.5:1 ratio applied to the acres of mining locations that had no previous permit authorization (shown as "new permit"). The Northwest Dade County Freshwater Lake Plan Implementing Committee (Committee) in their 1994 Phase I report to the legislature and the Lake Belt Working Group Issue Advisory Team report submitted to the South Florida Ecosystem Restoration Working Group recommended focusing the compensatory mitigation in the Pennsuco. The Pennsuco totals approximately 12,000 acres and not all of that is available for acquisition and restoration using the Fee. The Committee stated in its report and reiterated in its Phase II report that additional lands beyond Pennsuco will be needed. Since the acres available in the Pennsuco provide for many years of the total 50-year requirement, the identification of specific additional lands can be made later. At that time, the ratios and costs will be calculated and the cash flow analysis modified so that the Fee can be adjusted as provided by the Statute. The Corps permit provides for a periodic review and modification for this purpose, among others. The EIS provided an assessment of the changes in ecological functions and values that would result from the projections of the acres of mining and acres of restoration resulting from the Fee.

Five tables in the EIS are merged into a single Table B, Ecological aassessment of 50 year plan using habitat evaluation in Final EIS, enclosed. The lands within the boundaries of the Lake Belt Plan area but outside the Pennsuco total 45,392 acres, which contains 22,601 Habitat Units as described by the EIS (columns c and e.) The projected mining will impact 15,871 acres (this is larger than the 13,994 acres in the cash flow analysis, Table A, because Table A is calculating the tons that will be removed from the deep cut while the total impact will include wetlands cleared to construct littoral shelves). After creation of the littoral wetlands, there is a net loss of 3,973 Habitat Units, 17.6% of the total present (column m). The restoration of entire extent of the Pennsuco would add 1,807 Habitat Units, an 18% increase over the existing condition (column u), and if additional lands identical to the Pennsuco were acquired (so that the Pennsuco expanded by a multiplier of 2.2), a total of 3,973 Habitat Units would be gained balancing the projected loss.

During the development of this Mitigation Plan, the Corps published, in October 1998, the Joint State/Federal Mitigation Bank Review Team Process for Florida (Greenbook) that included a method for calculating mitigation debits and credits that uses the SFWMD's Wetland Rapid Assessment Procedure (WRAP) but then adjusts the raw scores by weighting, temporal loss, risk and proximity factors. Applicants and the Corps subsequently began using this also for applications that did not include mitigation banks. To ensure consistency between the Lake Belt and these other permits for residential and other purposes in the vicinity, particularly since some of these applicants were proposing to acquire and restore lands in the Pennsuco as compensatory mitigation, the Corps asked an interagency team to prepare WRAP scores for the Lake Belt so that these can be compared to several pending applications that were from early users of the Greenbook. Weighting, time, and risk factors were applied to both sets of scores. Therefore, the applicants who were using restoration of the Pennsuco would receive the similar

ecological assessment as the miners. The calculations were described to the affected applicants and via workshops to consultants in the area and subsequently have been used in permit decisions in the area.

The assessment of the changes in ecological functions and values that would result from projected mining and restoration are described in Table D (Ecological assessment of 50 year plan using the Greenbook/WRAP approach, enclosed.) Table D is identical in format to Table B except the Units per Acre are based on the Greenbook/WRAP method instead of the method developed for the EIS. After creation of the littoral wetlands, there is a net loss of 5,894 Units, 33.4 percent of the total present (column m), the restoration of entire extent of the Pennsuco would add 2,599 Units, a 32 percent increase over the existing condition (column u) and if additional lands identical to the Pennsuco were acquired (so that the Pennsuco expanded by a multiplier of 2.27), a total of 5,894 Units would be gained balancing the projected loss. The WRAP scores and weighting factors are described by Table C (Unit/acre calculation using Greenbook/WRAP approach, enclosed). The first line for each plant cover type shows the interagency scores for the six WRAP variables of the existing condition (the "without project" condition.) These scores are then multiplied by weighting factors to reflect that one or more variables are valued more highly than the others because of the landscape position of the site. The five questions that are asked to assign the weights are shown at the bottom of the page. For the Lake Belt area, the restoration of the native prairie vegetation and the resultant opportunity for increase use by wildlife are the wetland functions more highly valued, especially due to its location adjacent to the Water Conservation Areas. The third and fourth lines for each plant cover type repeat this process for the expected condition after completion of the restoration work (the "with project" condition.) The unit per acre assessment figures for the littoral shelves and lakes were developed by applying the WRAP questions to assess the level of wetland functions present but with recognition that WRAP was not

specifically written these cover types. For the lake itself, only the portion near the shore (near the littoral shelf) was considered to provide wetland functions, and that at a very low amount. Subsequent to the development of the scores in Table C, separate interagency WRAP assessments were developed as a Supplemental Planning Aid Report on the Water Preserve Areas Feasibility Study (a component of the Comprehensive Everglades Restoration Plan). Scores were developed for many areas, one of which fell within the Lake Belt (labeled the FP&L Strip). As seen in the table here, the unit per acre scores for the plant category Dense Melaleuca are similar between the two. Another comparison can be made between the plant category of "<25 permit melaleuca" used by the report to the category "10 to 50 permit melaleuca", where the resulting unit per acre score for the first is slightly higher then the other as would be expected. This provides another indication that the assessment used in Table D is in general not inconsistent with other assessments being performed in the area.

Table C	Report	
0.424	0.416	Dense Melaleuca
--	0.569	25 to 75% Melaleuca
0.623	--	50 to 70% Melaleuca
0.692	--	10 to 50% Melaleuca
--	0.767	< 25% Melaleuca

The temporal loss and risk factors are incorporated into Table E (Ecological assessment based on estimated pace of mining and restoration, enclosed). Table E starts with the projected acres of mining and of wetland restoration expected from the Fee for each year (Table A) and shows the corresponding Units impacted and restored. The units per acre in Table E that are used to multiply the acres linearly change from year zero to year 50 to reflect a gradual increase in the acres of Dense Melaleuca and a corresponding decrease of acres of Prairie and other cover types. The EIS reports a trend of 20 years so this estimate is conservative. This adjustment to the projection is made since the Corps can only require compensation commensurate to the

actual ecological loss at the time of impact. However, since in the early years some of the Fee collected will be held to earn interest to spend later on restoration, the temporal lag factor is incorporated by calculating the Present Worth (PW) of both the impacts and restoration (therefore, for mitigation that is delayed, more acres of restoration will be required to compensate for an acre of impact then if the mitigation had been provided the same year as the impact). After these adjustments, if everything occurs exactly as projected, the PW of the restoration would be 1.20 times the PW of the impact (bottom of column v), therefore there is a contingency of 20 percent to cover the risks such as if portions of the restoration fail, of changes in the pace of mining (if one year is higher acres then projected) or changes in pace of restoration (if delayed or takes longer to grow in).

The permit requires the Permittee to submit an annual report of the areas impacted by the mining operations. The Corps has been invited to participate in the interagency committee established by the Florida statute to direct expenditure of the Fee and that committee is required by the statute to submit an annual report. The Corps will then be able to compare on an annual basis the actual to the projected. The permit also establishes periodic review dates, the first being three years from date of issuance, to provide for a formal assessment of the progress of the mitigation and for modification if the projected cumulative units of ecological lift will be less than the projected units of loss. In addition, the permit is issued for a 10-year period since that is thought to be about the time that mitigation sites beyond the Pennsuco may need to be identified for the subsequent permitting increment.

Since Table E is an estimate, several more "What If" tables were prepared (labeled F1, F2, F3, etc.)

The first of these is Table F1 (What if assessment based on 10 year footprint mix of vegetation instead of the 50 year footprint?, enclosed.) The permit authorizes work within what

is described the 10-year footprint in the drawings. One consultant, Biological Research Associates (BRA) overlaid that footprint on the EIS vegetation maps and reported the acres of each plant type. Using these acres, Table F1 shows that after creation of the littoral wetlands, there is a net loss of 2,004 Units, 11.4 percent of the total present (bottom of column m.) A subtable within Table F1 shows that the average quantity of ecological units lost per acre of mining of the 10-year footprint is only 0.19% less then the average calculated in Table D based on the 50-year footprint. Since apparently the mix of vegetation of the 10-year footprint is similar to the larger, the fifty year analysis table (Table E) can be used for this permit.

Table F2 explores if no mining was authorized beyond the 10-Year footprint. The table shows in the year after the mining completed that littoral shelves would be constructed and the necessary Pennsuco lands would be acquired and restored so that the Present Worth of the units gained from restoration would equal the Present Worth of the units lost due to mining (PW Ratio = 1:1) Since in early years some of the Fee collected will be held to earn interest to spend later on restoration, there is expected to be monies in the fund that would go toward this last year of work in the Pennsuco. (The table starts 2 years before issuance of this permit to reflect that the Fee has been collected and is accumulating unspent since then with a balance of $4.6 million at the end of 2001.) This table also shows that if the pace of mining proceeds according to projection, the 10-year footprint will not be mined out for 14 years. This is not unexpected since each company is essentially ensuring they have a footprint needed if they out-compete the others in construction and other supply contracts, whereas the projection is an industry-wide estimate.

Table F3 is derived from an analysis developed during preparation of the EIS that split the acres to be mined into two categories. The first category is the area to be mined within footprints of existing permits. The second is the area of

mining not previously authorized. The first part has a higher proportion of melaleuca then the proportion within the total 50-year footprint, therefore the average number of units per acre (0.34, column e) is less then that calculated for the entire area (0.43, column j). For the second part, the reverse is true, where its average of 0.47 units per acre (column g) is higher then the entire area (0.43). However, the total units of impact for the 50 years is the same as reported earlier in Table D. A similar breakout is not available for the 10-year mining footprint. The Fee Plan (Table A) shows that in the earlier years, a greater quantity of mining will take place within the area of existing permits compared to the previously unauthorized area. Table F4 recalculates the ecological impact for each year by multiplying the acres mined within the existing footprint by the lower average unit per acre figure and multiplying the remaining acres by the higher average unit per acre figure. This results in a smaller quantity of ecological impact for the 10 year footprint then shown by Table F1 (which used the average unit per acre for the entire area).

Table F5 explores if no mining was authorized past the 10 year expiration of the permits and shows the acres of Pennsuco that would need to be acquired and restored to achieve a PW Ratio of 1:1.

Table F6 is the same as Table F5 but it re-adjusts the average unit/acre values to reflect that melaleuca has probably expanded since the mapping was done.

Table F7 explores a scenario suggested by the applicants, where all of the money received from the fee is spent on acquisition/restoration in the same year as received. This is different from all the other tables where some of the money is held in early years to earn interest. If mining is not authorized after the 10-year expiration, the expected acres in the Pennsuco to be have been acquired by the expiration date (4,560 acres) along with the construction of littoral marshes

after expiration will result in a PW Ratio of 1.08:1. In addition, for the first seven years the cumulative quantity of mitigation would be greater then the impact. By year 10, the cumulative shortfall (before construction of littoral marshes) would be 17 units, or 1.5% of the total impact. This shortfall is offset by the other non-numeric benefits resulting from the mitigation plan, including that the acquisition/restoration is expected to occur in a contiguous area and will be performed by a single manager. Table F8 extends this scenario (spend all the income as it is received) for the entire 50-year plan. The cumulative shortfall only lasts for 9 years and the highest year is only 23 units. The PW Ratio is 1.31:1. However, this would require a change in the schedule of expenditures (Table A). The revision is shown as Table F8. The total acres, approximately 22,688 acres, is less then the 23,426 acres in Table A, resulting in a ratio of 2.4:1 to "new mining," however, since the mitigation is not delayed there is less of a temporal adjustment so less acres are required.

Therefore, there are several estimates of how many acres of lands in the Pennsuco would be needed to offset the impacts of the 10-year permit authorization. Table F2 shows approximately 7,544 acres, Table F4 shows 6,439 acres, Table F5 shows 4,866 acres, Table F6 shows 4,390 acres, and Table F8 shows 4,561 acres. Of the approximately 12,000 acres in the Pennsuco, approximately 4,600 is privately-owned, another 5,800 is owned by government agencies (with the expectation that some of this land is available for mitigation once the mitigation trust fund reimburses the Save Our Rivers or other funding source for the acquisition cost), and approximately 1,800 is dedicated to other non-mining permit mitigation. There appears to be enough land available in the Pennsuco for the compensatory mitigation for these permits. In any case, if actual acquisition is unsuccessful, this will be reported as part of the annual reports and the permit provides periodic reviews for modification of the plan (including identification of additional lands).

Mining companies own a portion of the Pennsuco. In the discussions that led to the establishment of the Fee, the companies indicated they are willing to allow their lands to be acquired using the Fee at appraised value (the Fee cash flow analysis is based on appraised value), but there is no written commitment since these companies recognize they do not yet have a permit for the fifty year footprint, that even within the 50-year footprint there are State-owned lands that the State may choose not to lease for mining, and that areas within the fifty year footprint may become unminable depending on the outcome of the Miami-Dade County wellfield studies. However, if any of these or other events occur that result in a change in the footprint of the mining or of the restoration lands, the Corps can at any time (certainly at one of the periodic review dates the first of which is three years after permit issuance) recalculate Tables D, E and F using the revised acres of each plant type found within the revised footprint and then use that information to modify the permit so that the ecological units of restoration will balance the impact.

(ii) Additional compensation will be provided by construction of littoral marshes. The permit provides that by default these will consist of a 100-foot-wide shelf along the perimeter of the deep cut pit. The permit bases the number of acres to be constructed on the actual area of deep cut excavated, in case the total proposed footprint is not mined. However, as described by the Miami-Dade County Lake Belt Plan Implementation Committee's report to the Legislature (Phase II Plan), there are several competing issues related to their design, including what is the appropriate ecological design, whether any should be built near the wellfield, whether they should be built in locations that have been identified as possible locations for reservoirs or other features of the Comprehensive Everglades Restoration Plan, and coordination with public recreation. Therefore, the Permittee will monitor an existing shelf to better understand the default design and then construct a demonstration design so that by the 10 years after permit issuance, the permit can be modified with a compatible

design. In the 10-year ecological assessments in the previous sub-paragraph (Table F), the assessment is based on the default design presuming that no further mining would occur, but, to be conservative, in the 50-year assessment (Table E) the ecological credit for the littoral areas is not included since the timing of the littoral construction is unknown due to coordination with the wellfield and CERP.

(iii) The 10-year mining footprints overlap areas authorized by earlier permits. Many of the permits are only partially mined as of the date of issuance of the new permits. Many of the earlier permits require construction of littoral zones upon completion of the mining. However, the new permits authorize mining to continue. In some instances, the 10 year permit expands the area of mining or changes the configuration such that the mining will now take place at a location that the previous permit showed to be a littoral zone. The Corps tabulated the existing permits, the mitigation requirements, and how the new permits change the locations of the mining or mitigation. By special conditon, the Permittee is required to submit for review and approval of the Corps a permit-by-permit description of the actual area of the lake and an analysis of the mitigation obligation resulting from mining under the existing permit. The determinination will adjust the total mitigation obligation based on: proportion of the total deep cut mining actually performed compared to total authorized; relative functional value of the existing mitigation design compared to the default littoral design in the new permit; and temporal lag adjustment based on the originally projected date the mine would be complete and the date of the issuance of this permit. The determination will result in a calculation of the number of functional units owed. The new permit also requires construction of littoral shelf around the entire pit, both that dug under the existing and the new permits. The ecological lift from the acres of littoral marsh constructed based on 8.029% of the area of new mining has been included in Tables B, D, E and F for compensation of the impacts of the new mining. The remaining acres of littoral marsh (8.029% of the area of lake as

of the issuance of the new permits) in some cases will provide ecological lift sufficient to satisfy the mitigation obligation, even thought the littoral shelves will be in different locations from the existing permit. If there is a shortfall, the permittee is also required to submit a modification to the mitigation plan to incorporate the shortfall. During the review of the applications, the ten applicants' collective position on how the shortfall would be handled changed. One option is that each individual company with a shortfall would implement mitigation to offset that shortfall independent of and in addition to the compensation provided through the fee-per-ton mechanism and construction of littoral shelves. However, the current position is that shortfalls would be added to the impacts of the future mining. For purposes of tracking, the ecological units of shortfall would be added to the units of impact in Table E (the 50-year assessment). Table E currently projects a surplus of units at the end of the plan (598 Present Worth Units) and that does not include the units that would result from the littoral shelves. This is expected to more than cover the shortfall units to be added to the plan. Since the permit requires submission of an acceptable plan within 9 months and the permittee has a 10-year mining plan, there is time to trigger a review of the new permits if there is failure to provide the plan.

(iv) Each year, the Corps will receive a report from the Permittees describing the extent of areas cleared, construction of littoral shelves, and other information. The Corps will also receive the annual report prepared by the interagency committee overseeing the trust fund. Table H, enclosed, provides a draft worksheet that shows in one column (labeled "Estimated") the variables and calculations shown in Tables A through E. The worksheet shows a single year while the other tables show 50 years. The second column (labeled "Actual") provides blanks to enter data from the annual reports (such as estimated fee revenue, acres acquired, etc.) For those data items that are very different from the estimate, it is expected that the Corps will seek information to understand which variables and causes

contributed to that. Information such as this from the first three years will be used to perform the first periodic review of whether any of the estimates shown in Tables A through E need to be revised. This would result in a new Table E and a resulting calculation of the projected Present Worth Ratio at the end of the plan. Table F2 (providing a projection at the 10 year expiration of the permits) would also be revised. The permit requires that if the Corps determines that the projected units of lift will be less than the loss at the expiration of the Lake Belt mining permits (or extensions), then permittees will submit a plan for an appropriate modification to the Lake Belt permits. One example of a modification would be to revise the Fee Rate (the cents per ton) if mitigation costs increase above those estimated. The Statute requires the interagency committee to submit a recommendation to the Legislature recommending any adjustments such as this in 2010 (in eight years). In this case, the modification would be a revised Table A (Mitigation Fee Plan) and submittal to the Legislature. In any case, since the mining impacts are spread over 50 years, there is opportunity to adjust the permit (either in the work authorized or in the compensatory mitigation plan) as appropriate.

c. Findings: The project complies with the Guidelines because the permits authorize a footprint of mining that through a more efficient/compact design avoids the higher quality wetlands and minimizes risks to the wellfield and effects from changes in groundwater flows. The permit special conditions would be as follows:

Special Condition 1 provides for periodic review and adjustment of the permit based on new information, the first review to be at three years after permit issuance and a pre-application process at the time of the expiration of the 10 years, to consider extending the permit and expanding the footprint. Some locations near the wellfield are cross-hatched and the condition provides that mining will not occur in those areas until the permit is modified.

Special Condition 2 recognizes the fee per ton payment established by Florida Law but the condition requires submission of annual reports of the actual quantity of land cleared and submission of a plan to modify the permit if the projected quantity of ecological replacement is not going to compensate the ecological loss (based on the actual progress in the reports). Since part of the compensation is based on an expectation of some of the miners selling their lands for restoration, the condition also provides for a modification of the permit if the lands are not so provided.

Special Condition 3 requires the Permittee to accept responsibility for providing avoidance measures or compensation for effects of changes in groundwater flows. The actual plan will be submitted in a future year once, as discussed elsewhere in this memorandum, revised modeling and the design of the CERP components are further along.

Special Condition 4 requires construction of a default design of a 100-foot-wide littoral marsh. But, first data from an existing marsh will be collected and used to design a demonstration marsh, construction of which will commence after the 3-year review. The default design could then be modified before the expiration of the Permit.

Special Condition 5 requires the transfer of portions of the post-mining landscape to Miami-Dade County in fee-simple. Other portions will have a conservation easement applied to provide additional protection for the wellfield, to expedite the original vision of public recreational benefits of the post-mining landscape, and to protect from degradation of the ecological attributes from inappropriate uses.

Special Condition 6 requires that potential archeological sites be avoided unless an individual review of the site is conducted and a mitigation plan approved, both as provided by the National Historic Preservation Act.

Special Condition 7 places additional restrictions on the footprint and operations of the mining near the wellfield and requires water quality monitoring, all to minimize risk of contamination of the wellfield, as described elsewhere in this memorandum. The restrictions are to be reviewed 3 years after issuance of the permit, based on an expectation that by then the Miami-Dade County will have completed its review process and amendment to its ordinance.

Special Condition 8 requires the Permittee to conduct additional wildlife studies by the expiration of the permit in order to update wildlife information and to identify any effects related to mining, all to assist the evaluation of subsequent permit authorizations.

Special Condition 9 requires the Permittees to coordinate and cooperate with FPL to ensure safety and protection to FPL facilities throughout the mining process.

Special Condition 10 requires the Permittee by the first review date to provide the Corps with an audit report of previous permits issued indicating the amount of construction, the mitigation required, and the amount of mitigation completed and the success of the mitigation completed. If mitigation is stilled owed, the Permittee will provide a plan to compensate for any deficit.

The authorized mining footprint and the permit conditions act as a package to minimize the risk of adverse effects occurring by providing only for incremental impacts, by gathering information, and by forcing the periodic determination of whether adjustments are needed.

The Special Conditions noted above would be included in all ten permits, except for the following:

Whiterock's, Sunshine Rock's, and Sawgrass, project sites are located north of U.S. Highway 27, and Kendall's is south of U.S.

Highway 41. These are not in the region of the Northwest Wellfield protection areas. The projects, therefore, would be of no risk to the drinking water resource, and their permits would not include any of the special conditions associated with wellfield protection and land preservation.

All of the permits except those for Whiterock, Sunshine Rock, and Sawgrass, and Kendall do include the condition related to post-mining land preservation. These were not near the Northwest Wellfield and also are less likely to be incorporated into post-mining land uses envisioned by the Phase II Plan. However, since the littoral marshes are part of the compensatory mitigation requirements, these companies are still not authorized to place fill or otherwise impact them without authorization from the Corps.

The special condition to coordinate with FPL would apply only to Rinker, Tarmac, and Florida Rock. All other companies are not in the vicinity of the existing power line or the proposed power line.

It is noted Florida Rock, Rinker, and Tarmac are the only companies owning property within the Pennsuco; however, all permit instruments would include a special condition indicating the mitigation plan would have to be reviewed should any of the companies holding property within the Pennsuco area be unwilling to sell their land when an offer is made by the SFWMD.

10. Public interest review:

a. Public interest factors: The Corps reviewed all of the public interest factors. The Corps considers the public interest factors identified below as relevant to this proposal. The Corps considered both cumulative and secondary impacts on these public interest factors.

(1) Conservation: If the entire footprint of the ten year permits are mined (depends on market demand), the result is

that the public will enjoy the benefits of the construction material obtained at the expense of approximately 8 square miles of poor quality wetland, but in addition would benefit from the acquisition and restoration of 14.6 square miles of privately owned lands. The State plan envisions recreational use of the mined lakes.

(2) Economics: As described by Sections 3.20 and 6.14 and Appendix G of the EIS, the mining and processing of crushed limestone is an important source of jobs and economic activity in Miami-Dade County and an important resource for the State of Florida. The quantity of crushed limestone mined in the Lake Belt region of Miami-Dade County is approximately half of total state production and is shipped by rail to the Orlando area and as far north as Jacksonville. The most significant impact of Lake Belt mining is the production of goods, primarily building materials, for a growing Florida.

(3) Aesthetics: As described by Sections 3.17 and 6.11 of the EIS, the result of the project would be a progressive change of the landscape to be mined from prairie and melaleuca to lakes with littoral marshes. Within the Pennsuco, the melaleuca-dominated marsh would change to prairie. Both changes will enhance the aesthetics.

(4) General environmental concerns: The environmental effects are described in Section 6 of the EIS and elsewhere in this memorandum. The effects result from the reduction in spatial extent of an area of wetlands and their conversion to deep quarry lakes. This reduces the area available for wildlife foraging and other wetland functions and increases groundwater flows that change the hydropattern in adjacent wetlands. Since the wetlands are of poor quality, the loss of functions in the wetlands affected by mining can be replaced by increasing the functions in other wetlands (the Pennsuco) through restoration, thereby equalizing the pre- and post-mining ecological benefits, such as wildlife foraging. The change in groundwater flows can

be prevented by construction of water control structures or cutoff barriers, but the details will be coordinated with the CERP implementation of similar features.

(5) Wetlands: As described in the discussion of Compensatory Mitigation in paragraph 9.b.(4)(b) above, the quantity of ecological loss and replacement for the Plan was estimated using several methods: the narrative assessment by the State; the habitat evaluation found in the Sections 3.12 and 6.6 of the EIS; and the WRAP-based method similar to that used in other non-mining permit decisions in the area. All recognize that the invasion of melaleuca results in the creation of non-desirable vegetative structure and a non-desirable accompanying mix of wildlife species. Removal of melaleuca allows the native prairie to reestablish itself as the dominant species and results in an increase of wildlife and other wetland functions characteristic of the areas of the Everglades adjacent to the Lake Belt.

(6) Historic and cultural resources: Sections 3.15 and 8.4 of the EIS describe the presence of several sites in the Lake Belt Area that are identified in the Master Site File of the Florida Department of State. Since this area was once (prior to construction of the flood control canals and levees in the 1950s) indistinct from the rest of the Everglades, it is not surprising that the sites are based on observed signs of habitation on tree islands or upon the suspicion that such a site exists because the location is a tree island. The Permit provides that these sites will be avoided but provides that this restriction may be removed after a site-specific review that would involve preparation and submission of a Phase II investigation of the areas to determine whether the site is eligible for listing in the National Register of Historic Places. Impacts to these areas will not be permitted until the Corps determines that mitigation other than strict avoidance is acceptable. The Corps will make these determinations in

consultation with the Florida Department of State Division of Historic Resources and the Advisory Council on Historic Preservation in accordance with Law.

(7) Fish and wildlife values: Sections 3.11 and 6.4 and Appendix D of the EIS provide detailed analyses of the fish and wildlife resources in the Lake Belt area. They particularly focus on the effect of melaleuca on wildlife. Sections 6.5 and Annex A of the EIS provide the concurrence by U.S. Fish and Wildlife Service (FWS) with the Corps' determination that the project would have no effect on any Federally listed species. By a subsequent letter, the FWS expressed concern related to the Wood stork. A Biological Assessment was prepared by the applicants that refined the permit drawings to result in a more accurate quantification of projected wetland impacts, the results of a new field reconnaissance, and a review of literature on the species. The FWS also conducted a review and an aerial survey. The majority of the Wood storks observed were foraging in open-canopied wetlands yet only 11.6 percent of the project impacts will be to these wetlands. There will be no direct impacts to rookeries, and the areas impacted by the project are a very small part of the wetlands available to these rookeries (the majority are within public preserves). The compensatory mitigation plan is specifically designed to increase the area of open-canopied areas. Therefore, the FWS concurred with the Corps' determination that this project is not likely to adversely affect this species. The wetland evaluation described in paragraph (5) above included wildlife habitat. The project is therefore expected to result in no change in wildlife utilization compared to before mining, although on a smaller area of land.

(8) Flood hazards: The proposed project will have no adverse impact on flood control. No structures are proposed that would change existing flood levels or flood damage protection.

(9) Floodplain values: Flood control is provided by publicly managed levees, canals and control structures that have drained this portion of the Everglades. This project does not change the level of flood protection provided.

(10) Land use: Section 3.13 of the EIS describe existing land uses and those allowed by Miami-Dade County. Section 6.7 describes the then effort by the State's committee to develop a Master Plan for the Lake Belt Area. The Master Plan was developed and submitted to the State Legislature. The Permits are consistent with the allowable land uses and the Master Plan. In addition, the Corps has extensively coordinated the draft permit instrument with Miami-Dade County Department of Environmental Management to ensure the permits are consistent with the County requirements.

(11) Navigation: No existing navigation will be affected. The Master Plan (post-50-year land use) envisions opportunities for recreational boating.

(12) Shore erosion and accretion: Not applicable.

(13) Recreation: The proposed project will have minimal impact on recreational activities. Since the lands are privately owned, public outdoor recreational activities such as hiking and bird-watching are not present. The Master Plan (post-fifty year land use) envisions public recreational opportunities.

(14) Water supply: As described in paragraph 8.b.(1) above, there is a risk of contamination of the public wellfield, but the permit includes provisions to minimize that risk. As described in paragraph 8.b.(2) above, the construction of water control structures to prevent ground water seepage would, to succeed, require additional water to be delivered from the regional water supply. While this would not be the subject of a consumptive use permit issued by the State (as these are for wells), the Clean Water Act, 33 U.S.C. §1251(g), states "It is

the policy of Congress that the authority of each State to allocate quantities of water within its jurisdiction shall not be superseded, abrogated or otherwise impaired by this chapter." The SFWMD prepares long range planning documents that predict the future demands of water relative to land use. In addition, the Legislature tasked the Miami-Dade County Lake Belt Committee to look at this issue and the Committee recommended in its report that resolution needs to wait for completion of the design of CERP components, additional hydrologic modeling, and review of Miami-Dade County's Wellfield Protection Plan. The Corps in implementing the CERP program must include in the planning documents evaluation of whether any CERP component will cause a change in the regional water supply that could result in shortages to the urban users or a reduction in deliveries to the natural system.

However, the Corps 404 program must rely on the State, acting through its Environmental Resource Permit program and other authorities, as the forum for either allocating or denying water for any change in land use. Since Miami-Dade County and the Florida DEP are issuing permits for this mining, the Corps is relying on those permits as indications of State acceptance of the water supply ramifications. However, the Department of Army permit does require the Permittee to implement measures to prevent the seepage loss. This could be through coordination of water control structures or cutoff barriers designed by CERP. If the impact cannot be avoided, the result would be a reduction in water depths and duration in the adjacent wetlands. The permit provides that the Permittee would then provide compensation for the ecological loss. In any case, the change in quantity of water is small compared to the total, and for the ten years is small compared to the total fifty year plan, therefore the risk that adverse effects would occur is very small when, as the permit provides, the details are identified in later years.

(15) Water quality: As described in paragraph 9.a.(3) and (4) above, there are expected to be no changes in water

quality as the result of the proposed project. As described in paragraph 8.b.(2) above, there is concern that the project may increase risk of contamination of the public wellfield, but that the Permits incorporate provisions to minimize that risk.

(16) Energy needs: Not applicable.

(17) Safety: Rockmining is a heavy construction operation. It involves blasting, heavy equipment operations such as draglines and dozers, walking and driving over harsh terrain, involvement with rock crushing heavy equipment with long conveyor belts, driving heavily loaded trucks and other hazardous type activities. OSHA safety requirements provide regulatory control of the industry. Workers at the site are required to wear safety equipment such as steel-toed shoes, hard hats, eye and ear protection devices, etc. The blasting operation must meet strict set-back and safety requirements. Heavy trucks transporting the rock to railroad loading sites add to the heavy traffic congestion. Rockmining has been an on-going operation in Florida for a number of years. The industry has enormous reasons to minimize traumatic injuries, the least of which involve liability risks and insurance requirements. With use of proper safety controls the industry should be able to continue operating with minimal injuries. Public access to the sites are controlled.

(18) Food and fiber production: Not applicable.

(19) Mineral needs: The limestone rock resource found in the Lake Belt Area is of high quality. The resource is an important public resource needed for the continued growth and prosperity of the State of Florida. This was recognized by the State Legislature in establishing the Northwest Dade County Freshwater Lake Plan Implementation Committee, and in charging it with responsibility to “develop a plan which (b) maximizes the efficient recovery of limestone while promoting the social and economic welfare of the community and protecting the environment. Rock in the Lake Belt is one of the few deposits

in the State that meets Department of Transportation requirement for hardness and chemical content. Rock from the Lake Belt supplies much of Dade County and 40 percent of the State's rock, sand and cement for concrete, asphalt and road base, as further described in Appendix I of the EIS. As other mining areas in the State are depleted, the Lake Belt Area is expected to supply a greater percent of the State's rock in the future.

(20) Considerations of property ownership: The miners have owned lands in the Lake Belt Area for a number of years with expectations of mining them. The on-going mining in the area has already created about 5,400 acres of quarry lakes, and the miners hold permits for 5,900 more acres of quarry lakes. They have been mining since before the passage of the Amendments to the Federal Water Pollution Control Act of 1972 creating the Section 404 permit program, before the Corps expanded its jurisdiction to include areas such as these, and since before the State had jurisdiction in these areas. The miners have financial based expectations to continue mining in the Lake Belt Area.

b. Describe the relative extent of the public and private need for the proposed structure or work: The need for this project has been demonstrated by the strong support of the state government and the local community for the jobs that will be created and the materials that will be made available for infrastructure improvements. Public benefits include employment opportunities, provision of mineral resources, and a potential increase in the local tax base. Private benefits include land use and economic return on the property.

c. Describe the practicability of using reasonable alternative locations and methods to accomplish the objective of the proposed work where there are unresolved conflicts as to resource use: There are commenters who question the use of the wetland resource for mining. The permits include provisions that are expected to result in no adverse ecological effects resulting from the project. The only way to avoid this risk to

the Everglades ecosystem is to relocate the mining to other locations. As described in paragraph 8.a.(3)(c) above, other locations would result in impacts to other ecosystems, and probably to a greater extent than in the Everglades since the area of mining would have to be larger and the other ecosystems are smaller than even the remaining extent of the Everglades.

d. Describe the extent and permanence of the beneficial and/or detrimental effects, which the proposed work is likely to have on the public, and private uses to which the area is suited: The effects would be permanent.

e. Threatened or endangered species: As described in paragraph 10.a.(7) above, the project is not likely to adversely affect the Wood stork and will not affect any other Federally listed species.

f. Corps wetland policy: The Corps wetland policy requires that the beneficial effects of the project outweigh the detrimental impacts of the project.

g. Cumulative and secondary Impacts: As described at paragraphs 9.a.(7) and (8) above, these Permits are issued for ten years but the review includes evaluation of 50 years of mining. The review evaluates the effects of the loss of wetlands and considers the secondary effects resulting from the excavation of the rock.

h. Essential Fisheries Habitat (EFH): No adverse impacts to Essential Fish Habitat would result from the proposed project. The NMFS stated the resources affected are not ones under the responsibility of the NMFS.

11. Corps analysis of comments and responses. The comment from paragraph 7 are abbreviated and the response follows the >> symbol.

---

a. U.S. Environmental Protection Agency (EPA).

(1) The concern whether future mining may effect the public water supply is discussed at paragraph 8.b.(2). The EPA recommended any mining proximal to the Northwest Wellfield be consistent with Miami-Dade County's recommendations for setbacks, pending the completion of the risk assessment and wellfield protection plan. >> The EPA was actively involved in the review of this. The permit provides several measures to minimize the risk of adverse effects including monitoring of water quality. These measures will be reviewed three years after issuance. This is expected will give time for Miami-Dade County to complete its review of the risk assessment study and to modify its Wellfield Protection Ordinance.

(2) EPA asked for resolution of the mitigation plan. >> Additional tables were prepared (Tables B through F) to summarize the ecological assessments of the mitigation plan. These are described at paragraph 9.b.(4)(b)(i). The fee per ton assessment (summarized by Table A) is expected to acquire and restore sufficient acres of lands to provide an increase in wetland functions equivalent to the functions lost when wetlands are eliminated by mining.

(3) EPA suggested an initial interagency review 3 years after permit issuance with periodic reviews at least every 5 years. >> The permit provides the initial review at 3 years and the subsequent review date established at that time.

(4) EPA requested assurance that the rock miners will offer land held within the Pennsuco for sale at appraised value or for exchange. >> The permit includes a condition that if land not made available then that would trigger a review of the permit for adjustment.

(5) EPA requested assurance that the fee-per-ton-mitigation fee would be applied only to acquisition and restoration of wetlands within the Pennsuco. >> The priority

established by the various agencies that are members of the interagency oversight team for the mitigation fund is to acquire lands in Pennsuco first.

(6) EPA requested assurance that the adequacy of the fee would be re-examined and approved by the EPA prior to other uses. >> The permit provides for annual reports and for the first review at three years.

(7) EPA requested assurance of the location of mining in advance. >> The mining plans were overlaid on aerials as a check and the plans provided to EPA.

(8) EPA requested assurance the littoral shelves will be connected for contiguous habitat, success criteria will be described, assurance for success, required monitoring and reporting criteria will be described. >> The permit provides success criteria, etc., for the default design and location. The permit provides the default design could be changed, perhaps to be interconnected as suggested, after review of information gathered from and existing marsh and from construction of a demonstration marsh.

(9) EPA requested a list will be provided of other sites available for additional mitigation. >> Since the Pennsuco is expected to be sufficient for the first ten years, any such list would be speculative at this time. There is anticipated to be no problem finding additinal sites in the future.

(10) EPA requested participation in the review of any issued permits. >> The permit specifically names EPA in the review process.

(11) EPA requested assurance for continued involvement in the Mitigation Oversight Committee. >> The State has invited and EPA has accepted membership.

b. U.S. Department of the Interior: Fish and Wildlife Service (USFWS) and Everglades National Park of the National Park Service (ENP).

(1) The USFWS asked for additional information on the effect of the project on listed species, subsequently refined to the wood stork. >> Additional information was provided to USFWS regarding the use of lands within the Lake Belt by the wood stork and the expected changes. The loss of open-canopy lands is minimal in the 10-year footprint and the restoration will remove the canopy. The USFWS stated the project is not likely to adversely affect the wood stork.

(2) The USFWS requested a comprehensive mitigation plan that identifies specific lands and/or options necessary to satisfy the mitigation needs with emphasis on expected hydrological impacts from mining. >> The offsite mitigation is based on acquisition of lands as money becomes available in the mitigation fund. Specific parcels to be acquired will depend on funding availability and negotiations with the seller. The Pennsuco lands have been identified as the priority. The permit provides a default location for the littoral shelves but provides the location can change based on coordination with CERP and the results of the demonstration littoral marsh. A hydrologic mitigation solution has been modeled but the final selection of solution is best delayed in order to coordinate with CERP.

(3) The USFWS requested a detailed mitigation plan for the Pennsuco Mitigation Area with the technical feasibility of the mitigation, a system of accounting, monitoring plan, and success criteria, and suggested that the plan be reviewed by the Mitigation Bank Review Team. The ENP believed there is a lack of Federal oversight of the mitigation fund and the mitigation plan is incomplete. Both requested clarification of how enhancement measures will be carried out and benefits measured. >> Detailed tables were developed (Tables A through F) to describe the ecological assessments. Table E and F (the 50-year

and 10-year estimates) are the "ledger" to which annual reports of actual progress will be compared.

(4) The USFWS recommended limiting permits to 20 years, with periodic reviews every 3 years. ENP believed a 50-year permit is too long and interim reviews inadequately defined. Both requested a detailed description of the criteria being evaluated at the 3-year period with options used to correct inadequacies. >> The permit is a 10-year with a 3-year review. The permit conditions describe the factors to be reviewed.

(5) The USFWS recommended acquiring/donating lands within the Pennsuco up front to alleviate temporal loss of wetland functions and values. ENP recommended accelerated purchase of lands within the Pennsuco. >> Acquisition cannot occur until money is available. Tables E and F both increase the mitigation owed due to temporal lag.

(6) Both recommended transferring post-mining lands to an appropriate public entity for long-term management. >> The lands near the wellfield will be.

(7) USFWS and ENP recommended and establishing a 2,000-foot setback from the L-31 N Canal south of Tamiami Trail until such time it can be demonstrated rock mining would not adversely affect hydrology or other resources in Park. ENP suggested this area should be considered for a field test of the seepage barrier approach under consideration by the Corps and the South Florida Water Management District for CERP. >> The permit provides a 1,000 foot setback. Detailed discussion of the effects is provided at 8.b.(1) above (Groundwater Seepage).

(8) ENP believes the EIS is incomplete and issued prematurely. >> The EIS is issued based on information available at the time needed to support the review of permit applications.

(10) ENP believed the treatment of tree islands and littoral shelves is inadequate. >> The 10-year permit footprint provides for avoidance of tree islands.

(11) ENP suggests lands between the park and Krome Avenue and Bird Drive Basin be considered as possible sites for mitigation. >> Pennsuco lands have been given priority but additional sites will have to be identified in the future for mitigation.

(12) The ENP shares the concerns over possible contamination of the Northwest Wellfield. >> Is discussed at paragraph 8.b.(2) The permit provides several measures to minimize the risk of adverse effects. This is expected will give time for Miami-Dade County to complete its review of the risk assessment study and to modify its Wellfield Protection Ordinance.

(13) The USFWS suggests the Corps confirm land owned by the miners within the Pennsuco will be offered for sale at appraised value. >> The permit includes a condition that if land not made available then that would trigger a review of the permit for adjustment.

(14) Both requested a detailed proposal from each company for the development of littoral shelves to include location, construction design, and performance measures and also recommended the required 47 acres of littoral shelf per section be combined to maximize wildlife habitat value. >> The permit has added a three-step approach of first gathering data from an existing shelf, then construction of a demonstration, then consideration of whether to modify the default design and location based on that information.

(15) ENP suggested a methodology for measuring impacts of the expansion of deep water lakes should be developed before permits are issued. >> Impacts are being measured using several wetland assessment methods and two existing hydrologic

models. Impacts to the wellfield are being assessed by a new risk assessment study and in the interim water quality monitoring will be performed by the permittees.

c. National Marine Fisheries Service had no objections.

d. State Historic Preservation Officer recommended the site be subjected to a survey. >> Permit requires avoidance of known sites, which are generally located on existing or remaining tree islands.

e. Miami-Dade County Historic Preservation Division stated there were 29 archaeological sites rather than 27 and stated preservation of a site should not be discounted until evaluated. >> 29 sites were mapped and compared to mining plans. Permit requires avoidance. Permit provides for evaluation if site subsequently proposed for impact. Language coordinated with Miami-Dade County.

f. South Florida Regional Planning Council stated the compensatory mitigation be consistent with final EIS and impacts to the natural systems be minimized to the greatest extent feasible. >> Comparison of the mitigation plan under the permit and the EIS is described at 9.b.(4)(b)(i) and minimization described at 8.b above.

g. Miami-Dade County County Manager requests a watershed protection program be put in place and an adequate compensatory mitigation plan prepared. He is concerned about potential for contaminants reaching the nearby Northwest wellfield. >> This concern is discussed at paragraph 8.b.(2). The County was very actively involved in the review and development of the permit conditions to minimize the risk of adverse effects. The County is now incorporating the same permit conditions into their permits authorizing mining.

h. Florida Department of Transportation states hauling rock out of Miami-Dade County has an impact on traffic patterns.

>> This is an issue beyond the Corps jurisdiction. The County has authorized the land use and provision of adequate roads is a local responsibility. In any case, the proposed permit only continues existing mining.

i. Florida Power and Light Company expressed concern about the compatibility of mining activities with FPL's future and existing facilities in the area and recommends a special condition for the companies to seek approval from FPL prior to mining closer than 500 feet from their right-of-ways. >> FP&L can enforce any necessary restrictions through easements or other property rights and the Corps cannot expand those rights. A permit condition has been added to highlight need to coordinate with FP&L facilities.

j. Audubon of Florida concerns included wellfield protection, maintaining water quality, and lack of a specific mitigation plan, and recommends issuance of a 50-year permit with 5-year reviews and that the project be coordinated with other planning processes for the area. >> The permit includes several measures to minimize the risk of adverse effects to the wellfield. The permit is for 10 years with the first review in 3 years. The permit has been coordinated with the C&SF Restudy in advance through the Working Group Issue Advisory Team, with other activities via the Lake Belt Committee, and the coordination with CERP is describe in the section above on groundwater seepage. Subsequently, this organization added the following comments.

(1) Not appropriate to issue permits while there are several ongoing studies related to wellfield protection and seepage impacts. >> Decisions on applications for permits have to be made based on best available information

(2) A permit duration be established for a period not to exceed 3 years and upon expiration similar permits be issued for the same duration based upon findings of the wellfield

protection and seepage studies. >> The first review period is 3 years specifically to assess at new information from these wellfield studies.

(3) The fee per ton mitigation fee is inadequate and requests an interagency committee reevaluate the fee, fee growth time tables to account for potential acceleration of mining activities, report findings to the Corps and the Governing Board of the SFWMD. >> The assumptions and estimates are described in subparagraph 9.b.(4)(b)(i) and based on information available at this time the fee administrative mechanism is expected to result in mitigation sufficient to offset impacts. The SFWMD board will receive an annual report by the interagency mitigation committee.

(4) Identify sufficient land to fulfill the necessary mitigation ratio. >> It is expected that lands in the Pennsuco will provide mitigation for the first ten years of mining. Identifying additional lands at this time would be speculative but it is anticipated that other sites will be available in the future.

(5) Transfer of ownership of excavated quarries to public ownership at no additional cost. >> Those near the wellfield will be.

(6) Incorporate littoral shelves in mining plans at a minimum of 100 feet around the perimeter of each 1 square mile quarry. >> Permit provides this.

(7) Fee structure to exclude the expenditure of other state or federal funds. >> The fee schedule includes costs of land acquisition and other expenses needed to accomplish the mitigation.

(8) The Corps not authorize mining near the existing 60-day wellfield travel setback. >> None is proposed.

(9) No permits should be issued adjacent to L-31N and

Everglades National Park for 4-10 years, until such time seepage studies have been completed. >> Mining will be authorized up to 1,000 feet based on current hydrologic modeling. A seepage pilot project is underway under CERP and the permit requires coordination of seepage control with CERP. This is described in subparagraph 8.b.(1). Decisions on the application must be made based on available information and not further delayed.

(10) Issuance of a permit for mining in the western half of the area known as the Florida Power and Light Strip would be contrary to the recommendations of the Miami-Dade County Lake Belt Advisory Committee. >> The recommendation is based on whether the land is required for public restoration needs. The current draft Water Preserve Area Feasibility Study proposes preserving a portion of the subject lands as a buffer. Only a very small portion of mining under the ten year footprint is shown in the subject area and mining is not starting immediately, giving time for public acquisition, if needed.

k. Sierra Club stated issuance of permits would be inconsistent with the requirements of the Clean Water Act. Specific concerns included the following.

(1) Public notice did not include locations of the separate projects, discuss whether each site had been impacted by mining activities, analyze native wildlife, threatened or endangered species, or unique characteristic of each of the sites. >> The public notices identified the boundaries of all the proposed mining referenced landmarks landmarks and public land survey information. Since the mining is excavating a lake, there is not a large amount of detail to provide on the plan of work. The drawings showed existing lake. An analysis of native wildlife, listed species, and other site information is beyond the scope of a public notice but detailed information is provided in the referenced EIS.

(2) The destruction of wetlands for rock mining does not comply with the 404(b)(1) Guidelines nor can it survive a

public interest review since no alternative analysis has been prepared for each individual site, altering Everglades wetland habitat and creating unnatural lakes is detrimental and not in the public interest and mining will result in the alteration of hydrology and water quality and habitat. >> The 404(b)(1) analysis and public interest review were prepared subsequent to these comments and are found at paragraphs 8 and 9.

(3) Opposes the "mine now, mitigate later" approach and that a mitigation plan must be developed prior to the issuance of any Department of the Army permits. >> The mitigation plan is described at 9.b.(4)(b)(i) above.

(4) Failed to provide adequate opportunity for notice and comment. Two public notices issued. >> Accepted comments up to date of permit issuance.

(5) Failed to conduct adequate site-specific review for each individual site. >> The terrain is fairly uniform is character and information on the whole study area was collected. However, review included considerations of individual sites, examples include: breaking out vegetation type by site; proximity to wellfield and mining plans for the next 3 years; and siting of water quality monitoring locations.

(6) Corps has not addressed the environmental issues and is including conditions that would rely on the mining industry to voluntarily resolve outstanding issues after permits are issued. >> Issues evaluated in this memorandum. Conditions are requirements for various actions that minimize the potential for adverse effects.

(7) Corps should not issue any permits until the Phase II Master Plan is complete and environmental issues are resolved and disclosed to the public. >> Phase II Master Plan has been completed. Environmental issues disclosed to the public.

---

(8) Corps has not sought formal consultation and in not requiring a more detailed analysis of the impacts from mining on the wood stork. >> Besides the EIS, additional information was provided to FWS. Informal consultation is allowed under the regulations and was completed.

(9) Permits would impair the recovery of other endangered species such as the Cape Sable seaside sparrow, snail kite, and crocodile. >> The EIS provides an evaluation of wildlife present and potential effects. No adverse effect is expected.

(10) Failed to address impacts on species protected under the Migratory Bird Treaty Act. >> The EIS provides an evaluation of wildlife present and potential effects. No adverse effect is expected.

(11) Not fully considered the effects the project would have on historic sites, should attempt to avoid adverse impacts to historic sites, area subjected to surveys and consultation with the SHPO should occur. >> Permit requires these sites to be avoided. Consultation occurred with both SHPO and Miami-Dade County office.

(12) The Corps will be authorizing impacts to "the last remnant of the short hydroperiod marshes that are critical to the proper functioning of the Everglades ecosystem" without adequate justification or compliance with applicable laws. Evaluation of all mining permits should be suspended until the Corps is able to fully study the unresolved environmental issues and ensure issuance of a permit would be compatible with the future health and recovery of the Everglades ecosystem. >> More then one method used to perform ecological evaluation of these wetlands. Evaluation of environmental issues found in this memorandum. Evaluation of permit applications based on available information and should not wait for further studies.

---

l. Sierra Club, the National Resources Defense Council (NRDC), Friends of the Everglades, and the National Parks Conservation Association (NPCA) expressed the following concerns.

(1) Authorizing the destruction of Everglades wetlands "presents not only an immediate and substantial threat to the continued health and future restoration of the Everglades National Park, but constitutes a flagrant violation of numerous statutes and regulations." >> These complex and interrelated environmental issues are reviewed in this memorandum.

(2) Failed to provide the public with relevant information on the pending applications. >> Two public notices were issued and an EIS prepared and distributed.

(3) Reduction of the duration of the permit does not solve the legal and environmental problems associated with mining within the Lake Belt area. >> The shorter permit duration provides public notice and such procedures will be available in 10 years as part of the review of new information.

(4) Splitting the activity into smaller permits is contradictory to the purpose of preparing the environmental impact statement (EIS) for rock mining in the area: to address cumulative impacts, resolve outstanding issues association with mitigation, and ensure future mining would be conducted that is compatible with the long-term health of the Everglades ecosystem. Rather than address the inadequacies of the EIS, the Corps proposed to piece-meal the project. >> The EIS and this memorandum look at the total plan of development of the mining activities in a geographic area. The decision on the smaller 10 year permits are made with full understanding and disclosure of their relationship to the larger plan. Issuance of multiple permits, one to each company, is an administrative convenience rather then a single document with multiple companies.

---

(5) The Corps has not resolved issues associated with mitigation, potential hydrological damage to Everglades National Park, contamination of local ground water, loss of habitat, and loss of cultural resources. The Phase II Plan does not resolve these outstanding issues. Both the Corps and the Lakebelt Committee has passed resolution of these issues back to the other. The permit includes a footprint and special conditions that reflect deliberation on these issues and that minimize the potential for adverse effects.

(6) A comprehensive mitigation plan needs to be fully developed, funded, and implemented before additional mining is authorized. >> The plan is described in 9.b.(4)(b)(i), funding started over two years ago, and the agencies involved in the trust fund are ready to implement. Mitigation for wellfield concerns (including water quality monitoring) developed and ready to implement. Mitigation for seepage pending future development of the CERP components.

(7) Routinely, miners failed to follow through with mitigation by not completing all mining within a specific pit; completion of mining typically triggers the implementation of the mitigation plan. >> Many existing permits do not require littoral shelf construction until mining is completed and in some cases this is desirable since a shelf constructed early can be affected by mining operations within the pit. The current plan provides for concurrent off-site mitigation. The current plan also includes adjustments for temporal lag.

(8) Issuance of a permit to perform mining would be inconsistent with procedural and substantive requirements of the Comprehensive Everglades Restoration Plan (CERP). >> The permit is issued under Section 404 of the Clean Water Act, but the work has been coordinated to not preclude plans being developed by CERP to the extent possible. Until CERP designs a component, obtains funding, and acquires the lands, private landowners are not constrained by CERP in the use of their lands.

m. Mr. Ricardo Sabates feels further dredging activities would disturb his peaceful enjoyment of his adjacent property. >> The mining is a use allowed under local zoning.

n. Dr. Miriam Alonso, Miami-Dade County Commissioner, in her request for a public hearing, alluded to possible impacts as a result of blasting. >> Blasting is regulated by the State.

o. Dr. Sydney Bacchus stated the proposed project appears to be in conflict with two bills within the Florida Legislative session that are reportedly crucial to the restoration of the Everglades. In addition, adverse impacts on the Biscayne aquifer would be "significant," not only from an environmental standpoint, but also from an aquifer-supply standpoint. >> The FDEP is also issuing their permit for the same project so there should be no conflict with the Florida Legislature. Potential effects to the aquifer and drinking water are evaluated in the EIS and in 8.b.(2).

p. MISSGRITS@aol.com states the mining activities would undermine the restoration of the Everglades and have adverse impacts on wildlife and hydrology. >> The permits have been coordinated to the extent possible with the CERP. The impacts on wildlife and hydrology are evaluated in the memorandum.

q. Mr. Dennis Henize stated issuance of a permit for rock mining would be unthinkable given the current water emergency in South Florida. >> Water supply aspects are reserved to the State under the Clean Water Act. Issuance of the DEP permits provide an indication of the State's acceptance of the use of the land for this purpose. Some information on the expected change in water supply is found in the hydrologic evaluations of the EIS.

r. Mr. Boyce Rensberger stated he objected to the issuance of a permit for rock mining activities around Miami. >> Noted.

s. Mr. Michael A. Pizzi, Jr., President of Citizens Against Blasting, requested the Corps not issue any permits for blasting in the Lake Belt area and believe rock mining with the associated blasting has damaged the environment, homes, and personal property. >> Blasting is regulated by the State.

t. Ms. Buckley states the project could harm wildlife, the drinking water supply for Miami-Dade County, water supply to Everglades Park, and damage homes due to blasting. >> These complex interrelated issues are evaluated in this memorandum. Blasting is regulation by the State.

u. Miami-Dade County Department of Environmental Resources Management (DERM) stated concerns regarding the Northwest Wellfield protection have not been resolved. An adequate program to monitor and protect the Northwest Wellfield from water quality impacts, including pathogenic contamination, has not been developed. >> DERM was actively involved in the development of permit conditions, including a monitoring plan, related to the wellfield. They are now incorporating these same conditions in their permits. The DEP incorporated these conditions in their permits.

v. The Environmental & Land Use Law Center stated they support the comments and recommendations of the Audubon of Florida. >> Noted.

w. Ms. Coffey states creation of open pits would undermine the restoration of the Everglades. >> The mining footprints and hydrologic impacts have been coordinated with CERP to the extent possible. This included work by the Working Group Issue Advisory Team described in the EIS. Discussion of the hydrologic relationships is found starting at 8.b.(1)(h)

x. Ms. Peabody requested the Corps put a stop to the rock mining activities. >> Noted.

y. Mr. Bill Hosford urged the Corps to implement the Everglades restoration legislation and stated rock mining activities in the Lake Belt area would undermine the Everglades restoration plan and adversely effect wildlife and hydrology. >> These complex and interrelated issues are evaluated by this memorandum. The mining has been coordinate with CERP to the extent possible.

z. Meyer and Glitzenstein, on behalf of Sierra Club, the Natural Resources Defense Council, and Friends of the Everglades stated that the South Florida Wading Bird Report, October, 2001 "...confirmation that 90% of all Wood Storks in Everglades National Park are located at the Tamiami West colony..." is significant new information that requires reinitiation of consultation. The letter notes that the colony is located 4.6 miles from the southwestern corner of the Lake Belt study area and that the primary foraging radius is at least 12 miles. The letter states "...the Lakebelt project area is squarely within the primary foraging range for 90% of all Wood Storks nesting within Everglades National Park." >> The information that was available during consultation with FWS included the above-referenced colony and the foraging use of the lands within the Lake Belt. Biological Research Associates, in a reply on behalf of the applicants, shows the information on the colony found in the Report was found in the previously available information (except the Report provides a projection for the population in 2001) and then summarizes the previously available information that indicates this colony is not highly dependent on the lands within the 10-year mining footprint. The Report is not additional information requiring reinitiation.

aa. The Natural Resource Defense Council and Sierra Club, by letter dated January 25, 2002, requests preparation of a Supplemental Environmental Impact Statement (SEIS) before issuance of the proposed permits for the following reasons.

(1) The FEIS relied upon hydrologic modeling that did not incorporate CERP components; the WPA Plan proposes a

significant re-engineering of the water system; CERP documents show public goals and puposes for the Lakebelt areahave changed significantly since the FEIS was compiled; an SEIS would provide opportunity to assess the relationship between mining activities and hydrologic impacts; new modeling is considered more detailed and accurate; an August, 2000, SFWMD memorandum reported effects of mining on the CERP, including a 34% increased seepage; and questions the reliance on Pennsuco for mitigation. >> The CERP is a proposed plan. Each component of the plan, including the WPA, must be approved and funded to acquire the necessary lands to implement. The presence of a proposal does not preclude companies in the meantime from mining on their lands or where have rights granted by the landowner. The Working Group Issue Advisory Team, reported in the FEIS, provides coordination between the public goals for CERP and the mining plans. The subsequent CERP plans and the permits are not inconsistent with the results of that effort. The SFWMD memorandum is included in the discussion of CERP/mining relationship at 8.b.(1)(h). The CERP for planning purposes presumed that no mining on these largely-privately-owned lands would occur beyond that currently permitted. The 34% increase mentioned results if mining continued past the 10-year footprint. The currently permitted mining if completed would total approximately 9,000 acres. The new permits (10 year footprint) plus the existing area of lake total approximately 9,000 acres (these are deep cut acres, which influence the groundwater). The permittees are obligated to propose a plan to control seepage related to their mining but this requirement is not based on the need to protect the CERP but on the effects on the adjacent lands as reported by the FEIS. Newer modeling is expected to be better since includes results of new studies but permit decisions should not wait for additional studies. The permits provide for periodic reviews for new information.

(2) The FEIS relied upon the Phase II Master Plan which was yet to be prepared but the plan when completed did not include promised detailed mitigation plans. >> The outline of the mitigation plan for the fifty years is in the FEIS along

with an ecological assessment. The work subsequent to the FEIS included comparing the FEIS assessment to the assessment method used in other wetland permitting to ensure consistency and developing the necessary tables and language to implement the concept.

(3) The FEIS identified the Pennsuco wetlands as the primary site for wetland mitigation. >> This permit decision is consistent with that.

(4) The FEIS stated the project would utilize a mitigation ratio of 2.5:1, yet a draft permit template relies solely on timely payments by the miners into a State fund; the fund is intended for use in the Pennsuco and the FEIS states the Pennsuco will not provide enough; and numerous parties have raised concerns about the fee concept itself. >> The letter apparently references Special Condition subparagraph 2.a., while the remainder of the subparagraphs describe elaborate annual reporting and a clause that the mitigation plan will be modified if the units of ecological lift resulting from the fund and construction of littoral shelves does not offset the ecological loss. The Pennsuco will not provide enough for the total fifty years of mining but is expected to be sufficient for the ten years authorized by these new permits. The fee concept is discussed in 9.b.(4)(b)(i) above.

(5) The FEIS stated mining would not be permitted closer then 2,000 feet of the L-31N canal. One of the proposed permits gets as close as 1,000 feet. Everglades National Park stated it had serious concerns. The FEIS stated in the same paragraph that the "ultimate extent of mining...will be determined in the Phase II Report." >> That Report mapped the area "Mining Allowable to the extent consistent with Everglades Restoration" The effects of the mining on ENP and the relationship to the CERP have been coordinated with Department of Interior and are discussed within in 8.b.(1).

ab. Natural Resource Defense Council (NRDC) and on behalf

---

of the Sierra Club, by letter dated February 12, 2002, stated its letter is a supplement to its earlier request for a Supplemental Environmental Impact Statement and requested the Corps consider 93 documents enclosed with the letter in making its determination. >> The documents are drawn from a variety of sources including the internal files of DERM and FWS. 4 of the documents are copies of newspaper articles. 2 are Lake Belt Committee agendas, part of the process that resulted in the issuance of their Phase II report. 13 are letters between two parties but not addressed or copied to the Corps, however, since these agencies have given comments to the Corps directly by other correspondence it is difficult for the Corps to now incorporate these letters are those agency's comments. 7 documents are drafts of reports or other documents. 46 are emails, notes, memos internal to the agency in many cases representing exchanges of information regarding the Lake Belt or the permitting, however representatives of those agencies have provided directly to the Corps their agency's comments that presumably reflected the results of these exchanges. 5 of the documents were prepared by Bob Barron, the Corps Project Manager, responding to inquiries on this project: an email to DERM providing list of permits given time extensions; an email to representatives of NRDC, Sierra Club, Audubon of Florida, and Everglades Research Group providing hydrographs for the Pennsuco based on their questions on that during a meeting requested by NRDC by letter dated November 19, 2001; a handout given to the Lake Belt Committee during a presentation in response to their inquiry to the Corps comparison of several assessment methods of the mitigation required for the mining; an email to various individuals reporting the comments received in response to a presentation to the Lake Belt Committee; and, an email to various agencies responding to DEP's inquiry on the status of the review of the applications. 5 of the documents do not appear to have a direct bearing on the review of the permit applications: USGS report that describes the limestone aquifer based on transects across the Everglades, although it may have been used by the designers of the hydrologic models used in the FEIS; a paragraph in the Restudy report stating the WPA study

should be given high priority; e-mail from the Corps Hydrologic and Hydraulic Design (H&H) to DERM discussing alternative designs for components of the WPA; memorandum by H&H providing a geotechnical analysis for seepage from the Dade-Broward Levee canal related to the WPA; and, email from H&H to DERM asking for information on modeling done at that time within wellfield area and DERM's reply. The remaining 11 documents are exchanges of information as part of the coordination between the Corps and other agencies in the review of the applications and development of the permit special conditions: DERM technical report on the wellfield protection; email from DERM that provided information on DERM permits; DEP memo reporting the results of an interagency meeting in 1996 developing the basis of the 2.5:1 mitigation ratio; EPA email to applicants proposing the approach for industry/EPA/DERM/DEP joint development of a water quality monitoring plan; FDEP email providing comments on the draft permit template; DERM email providing comments on the draft permit template; DERM email forwarding DEP email setting up a permit coordination meeting in Tallahassee; DERM internal email discussing DEP's email reporting applicant's concerns with the proposal to limit mining near the wellfield; several emails between applicants, Corps, and agencies exchanging the lists of archeological sites; Corps email providing comments on the DERM email providing draft minutes of interagency meeting on littoral shelf design, during which the need for collection of data and construction of a test shelf was identified and has been incorporated into the permit conditions; and, FDEP email reporting results of meeting with applicants regarding waiver of State water quality certification.

Subseqent to this letter, the Natural Resource Defense Council (NRDC) and on behalf of the Sierra Club, by letter dated February 28, 2002, submitted an additional 44 documents. >> The documents are drawn from a variety of sources including the internal files of other agencies. 2 of the documents are copies of newspaper articles. 2 are Lake Belt Committee agendas, part of the process that resulted in the issuance of their Phase II report. 4 are letters between two parties but not addressed or

copied to the Corps, however, since these agencies have given comments to the Corps directly by other correspondence it is difficult for the Corps to now incorporate these letters are those agency's comments. 25 are emails, notes, memos internal to the agency in many cases representing exchanges of information regarding the Lake Belt or the permitting, however representatives of those agencies have provided directly to the Corps their agency's comments that presumably reflected the results of these exchanges. 4 of the documents were prepared by the Corps responding to inquiries on this project: the first is an email that was attached to apparently internal agency documents, but the email itself was advising another agency representative of the status of the ongoing discussions on the calculation of the mitigation requirements; the remaining three emails were part of an exchange of questions and answers with a representative of Florida Audubon on the mitigation information in the EIS. The remaining 7 documents are exchanges of information as part of the coordination between the Corps and other agencies in the review of the applications and development of the permit special conditions: letter from Planning and Management Consultants, Inc., providing a copy of the meeting minutes for the group whose final report is one of the appendices of the FEIS; memorandum from South Florida office to their Atlanta office, the Corps, Everglades National Park, and FWS describing the status of the development of the mitigation plan, including the then proposed (and subsequently enacted) legislation; an email in 1998 from a Corps representative to a FWS representative expressing concern at that time over the mitigation plan; a slide presentation the EPA economist on the Fee; a memorandum describing the 1996 interagency meeting establishing the mitigation ratio of 2.5:1, the meeting reported in the EIS; a DERM technical report on wellfield protection; and a letter from the Corps to the Everglades Coalition responding to their inquiry.

ac. Ms. Joann Don is against handing permits to miners.
>> Noted.

ad. Mr. Tom Moss concerned for runoff into lake. >> Water quality monitoring in EIS indicates has not been a problem in the past. New permits will include additional measures to protect.

ae. Emails from the NRDC Biogems website that asked the Corps not issue permits for mining in the Everglades until further environmental studies are completed. >> The Corps has responded by email to each sender. "Thank you for your interest in the Everglades ecosystem. The issues you list are complex and our review process has involved multiple agencies, non-governmental organizations, and concerned citizens. We are aware that other studies are underway or will be conducted. However, permit decisions should not be further delayed pending their completion. We base our decisions for individual permits on best available information, including that provided by the Final EIS. The proposed permits specifically require future consideration of newly completed studies, the first such review in 3 years. The overall concept which involves limiting mining toward the east and the acquisition and restoration of wetlands to the west along with appropriate safeguards and periodic reviews, has derived from the efforts of several groups and we expect will result in a win-win situation for the private landowners, the public, and the Everglades itself." The response also provided a link to a Corps web page with questions and answers.

af. Emails from the NRDC website that ask the Corps not to issue permits for mining in the Everglades until a Supplemental Environmental Impact Statement (EIS) is conducted. >> The Corps has responded by email to each sender. "The issues you list are complex and our review process has involved multiple agencies, non-governmental organizations, and concerned citizens. We are aware that other studies are underway or will be conducted. However, permit decisions should not be further delayed pending their completion. We base our decisions for individual permits on best available information, including that provided by the Final EIS. The proposed permits specifically require future

consideration of newly completed studies, the first such review in 3 years. It would be premature to prepare a Supplemental EIS at this time. The overall concept which involves limiting mining toward the east and the acquisition and restoration of wetlands to the west along with appropriate safeguards and periodic reviews, has derived from the efforts of several groups and we expect will result in a win-win result for the private landowners, the public, and the Everglades itself." The response also provided a link to a Corps web page with questions and answers.

ag. Formletter facsimiles from Carol/Trevelyan Strategy Group that urge the Corps not to issue permits until a Supplemental Environental Impact Statement has been conducted. >> The response is the same as the above paragraph. This response has not been sent to each indivual addressee listed on the facsimiles because of the sheer number of addressees.

ah. Numerous formletters stated "Limestone mining in the Everglades is bad for the citizens of Florida and bad for the environment." >> The numerous complex issues are discussed in this memorandum.

ai. Audubon of Florida and Tropical Audubon concerns related to the Final EIS include the following.

(1) Issued prematurely. >> Issued when needed to support review of applications.

(2) Additional hydrological modeling is needed. >> An additional model was subsequently performed and reported in this memorandum.

(3) Monitoring of the water quality should be maximized. >> Permit includes water quality monitoring.

(4) Measures need to be taken to minimize potential for contamination of wellfield. >> Permit provides several measures as described in 8.b.(2).

(5) No industrial land use of land in or near the Lakebelt should be allowed, protective levees should be constructed around the Lakebelt area, buffer zones should be established which should limit types of activities, Protection for the wellfields should be a requirement. >> The authorized mining footprints, wate quality monitoring, BMPs and other restrictions were developed with Miami-Dade County, FDEP and EPA.

.

(6) All quarry pits with littoral zones and the adjacent uplands need to be placed under a conservation easement. >> Most lands placed under easement or fee simple. In any case, since littoral zone is part of mitigation requirement, they are to remain undisturbed unless Corps authorizes.

(7) Lands within the Lakebelt boundary should be considered first for mitigation before looking to adjacent property. >> Pennsuco lands are priority.

(8) Comprehensive mitigation plan should be developed. >> Described in 9.b.(4)(b)(i).

(9) Littoral shelves should be designed with a 20:1 slope, placed along the western edge of mining, designed with an uneven edge to increase habitat diversity. >> The default design is 100-foot flat shelf but permit provides for construction of a demonstration project and a review of the design and relocation.

(10) Mitigation funds not be used for the purchase of credit within a mitigation bank. >> Not precluded but acquisition and restoration of lands in Pennsuco are priority.

(11) Hydrologic mitigation should be required and should include deeding of all lands in the Lakebelt planning area. >> Mitigation is required but design delayed to coordinate with CERP. Lands around the wellfield to be deeded for wellfield protection.

(12) Address Trail Glades Range or Thompson Park areas. >> It is expected this will not affect these.

(13) Protect archaeological sites. >> Permit requires avoidance.

(14) The EIS does not adequately address practicable alternatives to limestone mining. >> Alternatives analysis provided at paragraph 8 above.

(15) Expand land use section in the EIS to address adjacent areas. >> Effects on adjacent land uses described elsewhere in EIS and also where appropriate in this memorandum.

(16) Socio-economic discussions don't account for costs associated with the loss of valuable environmental lands or address impacts on quality of life, water resources, and other important socio-economic issues including adverse effects of growth and that development within the Lakebelt area will drain fiscal resources from eastern communities. >> The other portions of the EIS discuss the environmental impacts, though not expressed in dollars. The EIS and this memorandum evaluates the effects of the loss of wetlands and considers the secondary effects resulting from the excavation of the rock. The project is in response to the public need for construction material and an evaluation of the benefits and detriments of the use of that material and the other aspects of the State's economy is beyond the scope of this permit application.

aj. Mr. Lloyd Bell does not believe that there are no practicable alternatives to mining in the Lakebelt, noting he has purchased 67 acres at the Port of Fort Pierce with necessary

rail connections. >> Expansion of port facilities in Florida and at the shipping point (rail connections, deepening of channels, construction of docks and handling equipment) are not impossible but would be very difficult and costly due to the large amount of material to be moved.

ak. Florida Biodiversity Project states could be irreversible damage to the natural hydrology of the area, recommends the mitigation money be better utilized to purchase, restore, and manage the remaining wetlands, the EIS is inadequate, the plan is inconsistent with restoration of the Everglades, lacks independent peer review, is vague and nothing is guaranteed. >> The 10-year permit has only an incremental effect of the total plan described by the EIS. The degree of effect on hydrology is discussed in 8.b.(1) above and the permit requires measures to address these. The mitigation dollars are utilized to acquire and restore lands within the Lake Belt in a location designed to fit with other restoration plans. The permit review has been extensively coordinated with other agencies to utilize their expertise, for example, EPA in the water quality concerns. The EIS describes the mitigation conceptually and the permit review has added the necessary details to implement.

al. Miami-Dade County Environmental Resources Management (DERM) concerns regarding the final EIS included the following.

(1) The "no action alternative" has not been adequately evaluated on how the alternative could work if the mitigation required was consistent with current mitigation requirements. >> The alternative analysis is provided at paragraph 8. Chief benefit is the "no action" would complicate coordination of off-site mitigation into a single area.

(2) Potential impacts from pathogenic contamination of the Northwest Wellfield. >> DERM has subsequently participated extensively in developing the permit conditions to address this issue.

(3) Current mitigation requirements do not compensate for impacts, reviews should occur every 5 years, no mention how these reviews would be accomplished, long-term mitigation plan is needed, permits should only be issued based on mitigation already identified, functional calculation needs to be redone if the lakes are to be larger than 1 square mile. >> Mitigation plan described at 9.b.(4)(b)(i) above. Reviews will be every 3 years and permit conditions detail how done. Assessment based on acres of mining no matter what size lake.

(4) No functional unit value would be assessed for any areas slated to be reservoirs under the Comprehensive Everglades Restoration Plan. >> The final location and timing of littoral shelves is to be reviewed in the next ten years. The intent is to not construct a shelf that will be impacted by the CERP. However, much of CERP remains a plan and the landowner can choose to do so until the CERP acquires the property.

(5) Require at a minimum the creation of 496 acres of littoral shelves. >> Permit requires littoral zones based on a percent of mining. This coordinated with DERM.

(6) Recommends a supplement to the Final EIS be prepared to address the concerns identified prior to the issuance of any Department of the Army permits. >> Permit decisions should not be further delayed for further studies. The Corps may prepare a Supplemental EIS to support the decisions on future permit modifications if there are significant new circumstances or new information relevant to new environmental concerns and bearing on a proposed permit action.

am. Miami-Dade Water and Sewer Department states the Final EIS does not provide reasonable assurances that the wellfield would be protected from contamination from surface water influences and recommends a supplement final EIS be prepared to address the water quality issue prior to the issuance of any

permits. >> Permit decisions should not be further delayed for further studies. The Department was participated extensively in the coordination between the Corps, FDEP, EPA and DERM in developing the mining footprint and other measures in the permit to protect the wellfield based on available information. The permit provides for a review of these measures in three years.

an. EPA recommended the following relative to the Final EIS.

(1) Decision not be made until the Phase II Master Plan is complete. >> Phase II report completed.

(2) Prepare a supplemental EIS to address any of the outstanding, unresolved issues, particularly for drinking water protection. >> Permit decisions should not be further delayed for further studies. The EPA participated extensively in the coordination between the Corps, FDEP, EPA and DERM in developing the mining footprint and other measures in the permit to protect the wellfield based on available information. The permit provides for a review of these measures in three years.

(3) Mitigation requirements need to be resolved. Coordinated with EPA during the permit review. >> Plan is described at 9.b.(4)(b)(i) above.

(4) Criterion for reviewing permits needs to be established. >> Developed and coordinated with EPA and included in permit conditions.

(5) Additional areas for mitigation need to be identified. >> Permit authorization limited to ten years based on availability of Pennsuco lands. Additional lands will be need to be identified for subsequent mining authorizations.

(6) Concerned over impacts due to seepage. >> Modeling and other information reviewed with EPA. Issue discussed at 8.b.(1) above.

12. Determinations:

a. Finding of No Significant Impact (FONSI): Having reviewed the information provided by the applicant and all interested parties and an assessment of the environmental impacts, I find that this permit action will not have a significant impact on the quality of the human environment. Therefore, an Environmental Impact Statement will not be required.

b. Compliance with 404(b)(1) Guidelines: Having completed the evaluation in paragraph 8 above, I have determined that the proposed discharge complies with the 404(b)(1) guidelines.

c. Section 176(c) of the Clean Air Act General Conformity Rule Review: The proposed permit action has been analyzed for conformity applicability pursuant to regulations implementing Section 176(c) of the Clean Air Act. It has been determined that the activities proposed under this permit will not exceed de minimis levels of direct or indirect emissions of a criteria pollutant or its precursors and are exempted by 40 CFR Part 93.153. Any later indirect emissions are generally not within the Corps' continuing program responsibility and generally cannot be practicably controlled by the Corps. For these reasons a conformity determination is not required for this permit action.

d. Public Hearing Request: There were several requests for a public hearing. The project impacts have been reduced and would occur over a 10-year period with mitigation proposed within the Pennsuco. The permit has extensive conditions to address concerns to minimized ecological effects. The Corps does not regulate blasting; therefore, concerns regarding any associated blasting would need to be pursued with the agency responsible for regulating blasting. A public hearing is not held unless additional information is necessary to make a decision on the application. I have reviewed the information

provided and have concluded that substantive additional information would not be received and that a public hearing would not benefit the decision-making process on this permit application. Each of the requestors will be notified of the determination not to hold a public hearing by separate letter.

e. Public Interest Determination: I find that issuance of a Department of the Army permit is not contrary to the public interest.

PREPARED BY:

BOB BARRON
Project Manager

DIANNE S. GRIFFIN
Project Manager

REVIEWED BY:

JOHN R. HALL
Chief, Regulatory Division

APPROVED BY:

JAMES G. MAY
Colonel, Corps of Engineers
Commanding

Impacts for the first 10 years for each mining company

	Continental	Florida Rock	Kendall	Lowell-Dunn	Pan American	Rinker - FEC	Rinker - SLC	Sawgrass	Sunshine	Tarmac	White Rock	TOTALS
Total Impact	146.9	631.5	536.7	122.1	410.6	1101.1	323.6	137.02	68.7	989.4	941.7	5409.32
Developed Areas	0	0.7	0	1.0	2.9	7.4	0	29.5	0.2	3.2	1.1	46.00
Agricultural	0	0	0	0	0	215.9	0	3.8	7.3	0	258.1	485.10
water	0.1	36.8	3.3	0.4	13.5	0.6	3.5	15.8	0	0	8.8	82.80
canals	0	0	0	0	1.2	4.9	2.4	0	0	6.2	2.1	16.80
lakes	16.1	18.4	0	3.0	10.9	4.3	0.2	0	0.6	0	1.2	54.70
lake perimeter	32.9	93.0	12.9	4.8	36.6	13.4	6.4	5.6	20.5	3.5	26.9	256.50
Tree islands	0	2.8	13.9	0	0	0	3.0	0	0	0	0.1	19.80
Prairie w/50% Melaleuca	0	37.0	27.3	0	34.8	38.9	46.7	0	7.3	124.7	0	316.70
prairie w/75% Melaleuca	0	42.4	3.2	0	80.8	87.8	96.7	0.1	0	69.6	0	380.60
Dense Melaleuca	35	104.4	26.1	112.1	73.4	576.9	154.1	82.22	3.3	426.2	216.6	1810.32
Dense Melaleuca saplings	62.3	181.4	0	0	125.7	58.2	0	0	15.7	346.3	325.2	1114.80
Prairie	0	12.7	425.6	0	0	0	4.2	0	0	8.9	25.3	476.70
Disturbed Prairie w/50% Melaleuca	0	0	0	0	0	58.0	0	0	0	0	0	58.00
Disturbed Prairie w/75% Melaleuca	0	0	0	0	0	0	0	0	0	0	2.3	2.30
Other Disturbed Lands	0.5	101.9	24.4	0.8	22.2	34.8	6.4	0	13.8	0.8	74	279.60
FPL Easement	0	0	0	0	8.6	0	0	0	0	0	0	8.60

Table A Mitigation Fee Plan *(note 1)*

Year	Yr	Mining Existing Permits	Mining New Permits	Total Mining Area	Tons of material	Fee $/ton	Total Fee expected this year	Mining New Permits	Mitigation Acres Owed	Cost to Restore $/Acre	Total Spend on Mitigation this year
	a	b	c	d	e	f	g	h	k	m	n
		(note 2)	*(note 2)*	*d = b+c*	*(note 3)*	*(note 4)*	*g = e * f*	*h = c*	*k = h*2.5*	*(note 5)*	*n = k * m*
1999	1	78.1	0.0	78.1	9,756,250	0.05000	487,813	0.0	0.0	6,142	0
2000	2	312.0	0.0	312.0	39,000,000	0.05000	1,950,000	0.0	0.0	6,142	0
2001	3	331.5	0.0	331.5	41,437,500	0.05265	2,181,684	0.0	0.0	6,339	0
2002	4	266.0	65.5	331.5	41,437,500	0.05544	2,297,314	65.5	163.8	6,541	1,071,151
2003	5	261.0	70.5	331.5	41,437,500	0.05838	2,419,071	70.5	176.3	6,751	1,189,811
2004	6	256.0	75.5	331.5	41,437,500	0.06147	2,547,282	75.5	188.8	6,967	1,314,969
2005	7	226.0	105.5	331.5	41,437,500	0.06473	2,682,288	105.5	263.8	7,190	1,896,273
2006	8	226.0	105.5	331.5	41,437,500	0.06816	2,824,449	105.5	263.8	7,420	1,956,953
2007	9	226.0	105.5	331.5	41,437,500	0.07177	2,974,145	105.5	263.8	7,657	2,019,576
2008	10	226.0	105.5	331.5	41,437,500	0.07558	3,131,775	105.5	263.8	7,902	2,084,202
2009	11	226.0	105.5	331.5	41,437,500	0.07958	3,297,759	105.5	263.8	8,155	2,150,897
2010	12	215.0	116.5	331.5	41,437,500	0.08380	3,472,540	116.5	291.3	8,416	2,451,166
2011	13	207.0	124.5	331.5	41,437,500	0.08824	3,656,585	124.5	311.3	8,685	2,703,310
2012	14	181.0	149.5	330.5	41,312,500	0.09292	3,838,769	149.5	373.8	8,963	3,350,020
2013	15	129.0	201.5	330.5	41,312,500	0.09785	4,042,223	201.5	503.8	9,250	4,659,732
2014	16	129.0	201.5	330.5	41,312,500	0.10303	4,256,461	201.5	503.8	9,546	4,808,843
2015	17	119.0	211.5	330.5	41,312,500	0.10849	4,482,054	211.5	528.8	9,852	5,209,016
2016	18	75.0	255.5	330.5	41,312,500	0.11424	4,719,602	255.5	638.8	10,167	6,494,054
2017	19	105.0	225.5	330.5	41,312,500	0.12030	4,969,741	225.5	563.8	10,492	5,914,952
2018	20	110.0	220.5	330.5	41,312,500	0.12667	5,233,138	220.5	551.3	10,828	5,968,882
2019	21	115.0	215.5	330.5	41,312,500	0.13339	5,510,494	215.5	538.8	11,174	6,020,206
2020	22	125.0	205.5	330.5	41,312,500	0.14046	5,802,550	205.5	513.8	11,532	5,924,553
2021	23	125.0	205.5	330.5	41,312,500	0.14790	6,110,085	205.5	513.8	11,901	6,114,139
2022	24	115.0	215.5	330.5	41,312,500	0.15574	6,433,920	215.5	538.8	12,282	6,616,837
2023	25	107.0	223.5	330.5	41,312,500	0.16399	6,774,918	223.5	558.8	12,675	7,082,073
2024	26	75.0	255.5	330.5	41,312,500	0.17268	7,133,988	255.5	638.8	13,080	8,355,135
2025	27	16.5	258.5	275.0	34,375,000	0.18184	6,250,604	258.5	646.3	13,499	8,723,742
2026	28	32.0	263.5	295.5	36,937,500	0.19147	7,072,536	263.5	658.8	13,931	9,177,039
2027	29	8.7	317.5	326.2	40,775,000	0.20162	8,221,101	317.5	793.8	14,377	11,411,569
2028	30	0.0	308.5	308.5	38,562,500	0.21231	8,187,090	308.5	771.3	14,837	11,442,911
2029	31	0.0	252.5	252.5	31,562,500	0.22356	7,056,091	252.5	631.3	15,312	9,665,458
2030	32	0.0	247.5	247.5	30,937,500	0.23541	7,282,934	247.5	618.8	15,802	9,777,233
2031	33	0.0	247.5	247.5	30,937,500	0.24788	7,668,929	247.5	618.8	16,307	10,090,104
2032	34	0.0	252.5	252.5	31,562,500	0.26102	8,238,521	252.5	631.3	16,829	10,623,351
2033	35	0.0	252.5	252.5	31,562,500	0.27486	8,675,163	252.5	631.3	17,368	10,963,298
2034	36	0.0	252.5	252.5	31,562,500	0.28942	9,134,947	252.5	631.3	17,923	11,314,123
2035	37	0.0	247.5	247.5	30,937,500	0.30476	9,428,622	247.5	618.8	18,497	11,444,964
2036	38	0.0	237.5	237.5	29,687,500	0.32092	9,527,194	237.5	593.8	19,089	11,333,982
2037	39	0.0	233.0	233.0	29,125,000	0.33792	9,842,052	233.0	582.5	19,700	11,475,049
2038	40	0.0	231.0	231.0	28,875,000	0.35583	10,274,723	231.0	577.5	20,330	11,740,600
2039	41	0.0	235.5	235.5	29,437,500	0.37469	11,030,048	235.5	588.8	20,981	12,352,331
2040	42	0.0	235.5	235.5	29,437,500	0.39455	11,614,641	235.5	588.8	21,652	12,747,606
2041	43	0.0	235.5	235.5	29,437,500	0.41546	12,230,217	235.5	588.8	22,345	13,155,529
2042	44	0.0	235.5	235.5	29,437,500	0.43748	12,878,418	235.5	588.8	23,060	13,576,506
2043	45	0.0	235.5	235.5	29,437,500	0.46067	13,560,974	235.5	588.8	23,798	14,010,954
2044	46	0.0	235.5	235.5	29,437,500	0.48509	14,279,706	235.5	588.8	24,559	14,459,305
2045	47	0.0	235.5	235.5	29,437,500	0.51080	15,036,530	235.5	588.8	25,345	14,922,003
2046	48	0.0	228.5	228.5	28,562,500	0.53787	15,362,833	228.5	571.3	26,156	14,941,772
2047	49	0.0	124.8	124.8	15,600,000	0.56637	8,835,437	124.8	312.0	26,993	8,421,902
Totals:		4,623.8	9,370.3	13,994.1			334,919,958		23,425.8		363,128,078

Notes:

(1) This table based on Appendix 2 of the Lake Belt Mitigation Committee Annual Report for 2000.
Appendix 2 was based on an EPA analysis of an earlier table submitted by the industry.

(2) Appendix 2 adjusted the industry-submitted year-by-year projections to start October 1999 (when the fee started).
Here (Table A), 96.8 acres of "New Permit" estimated for 1999, 2000 & 2001were added to "Existing Permit" column and the acres (96.8 acres) added back in Year 49. Existing Permit acres for Years 27, 28, 29 also reduced by 96.8 acres.

(3) Based on average of 125,000 tons per acre mined. Fee includes both existing and new permitted areas.

(4) Fee starts at $0.05/ton, increased each year by 2.1% + a cost growth index. Here, used an index value of 3.1%

(5) Cost of acquiring, restoring, and management of Pennsuco land. Here, estimate cost increases 3.5% a year.

Table B (part 1 of 2) Ecological assessment of 50 year plan using habitat evaluation in Final EIS (FEIS)

This calculation based on all of the impact and mitigation performed in one year and does not include adjustments for time lag, etc. shown in Table E.

		Inventory of Land Covers ca. 1992		Within the Mine Area (Lake Belt Study Area minus Pennsuco)								
				"Pre-project" Conditon of Mine Area			Ecological Condition after Mining			Condition after Littoral Marshes Built		
		Acres EIS Study Area	Subtotal in Pennsuco	Subtotal in Mine Area	Units/Acre	Quantity of Habitat Units	Change due to mining	Resulting Landcover	Quantity of Habitat Units	Change due to marshes	Resulting Landcover	Quantity of Habitat Units
		a	b	c	d	e	f	g	h	j	k	m
		Table 3.10-1	*Table 7.1-2*	*c = a - b*	*Table 3.12-3*	*e = d * c*	*Table 6.6-1*	*g = c + f*	*h = d * g*	*(see note)*	*k = g + j*	*m = d * k*
Natural Covertypes												
P	Prairie	12,598.69	5,862.77	6,735.92	0.98	6,601.20	-944.37	5,791.55	5,675.72		5,791.55	5,675.72
P50	Prairie w/ Mel (10-50%)	5,065.26	1,899.99	3,165.27	0.90	2,848.74	-1,409.45	1,755.82	1,580.24		1,755.82	1,580.24
P75	Prairie w/ Mel (50-75%)	4,220.22	2,090.85	2,129.37	0.72	1,533.15	-1,209.22	920.15	662.51		920.15	662.51
DM	Dense Melaleuca	11,923.10	1,779.80	10,143.30	0.42	4,260.19	-4,991.62	5,151.68	2,163.71		5,151.68	2,163.71
DMS	Dense Mel Saplings	6,642.83	101.27	6,541.56	0.44	2,878.29	-3,419.46	3,122.10	1,373.72		3,122.10	1,373.72
TI	Tree Islands	346.07	60.61	285.46	0.91	259.77	-88.99	196.47	178.79		196.47	178.79
WH	Willow Heads	25.78	25.78	0.00	0.95	0.00	0.00	0.00	0.00		0.00	0.00
	Pond Apple	14.82	0.00	14.82	0.92	13.63	0.00	14.82	13.63		14.82	13.63
Man-Altered Covers												
D	Disturbed (Forest&Open)	2,627.02	112.36	2,514.66	0.50	1,257.33	-763.65	1,751.01	875.51		1,751.01	875.51
DP	Disturbed Prairie	19.10	0.00	19.10	0.69	13.18	0.00	19.10	13.18		19.10	13.18
DP50	Dist Pra w/Mel (10-50%)	414.39	0.00	414.39	0.67	277.64	-269.12	145.27	97.33		145.27	97.33
DP75	Dist Pra w/Mel (50-75%)	216.81	0.00	216.81	0.62	134.42	-146.22	70.59	43.77		70.59	43.77
C	Canals	438.96	91.18	347.78	0.37	128.68	-25.67	322.11	119.18		322.11	119.18
LP	Lake Perimeter	1,666.91	0.00	1,666.91	0.04	66.68	-972.32	694.59	27.78		694.59	27.78
WH	Other Water/Impoundmt	542.66	5.44	537.22	0.31	166.54	-208.14	329.08	102.01		329.08	102.01
AG	Agriculture	3,336.56	0.00	3,336.56	0.17	567.22	-1,327.52	2,009.04	341.54		2,009.04	341.54
FPL	FPL Transmission	718.87	0.00	718.87	0.64	460.08	-18.50	700.37	448.24		700.37	448.24
DV	Developed	1,771.18	89.00	1,682.18	0.06	100.93	-76.56	1,605.62	96.34		1,605.62	96.34
Mining												
L	Existing Lakes	4,926.22	4.76	4,921.46	0.21	1,033.51		4,921.46	1,033.51	0.00	4,921.46	1,033.51
L	New lakes @ 640.0 ac				0.00		15,870.81	15,870.81	0.00	-15,870.81		
	DeepCut @ 592.43 ac				0.21		(see note for column "f")			14,691.25	14,691.25	3,085.16
	Littoral @ 45.7 ac				0.59					1,179.56	1,179.56	695.94
Total Acres		57,515.45	12,123.81	45,391.64				45,391.64			45,391.64	
Total Ecological Units						22,601.16			14,846.69			18,627.80
				Incremental change ecological condition due to mining = (h - e) =					-7,754.47			
				Incremental Unit per Acre change due to mining = (h - e) / f =					-0.49			
				Incremental change as % of "pre-project" condition = (h - e) / e =					-34.3%			
										Incremental change ecological condition due to construction of littoral marsh = (m - h) =		3,781.10
										Incremental Unit per Acre change due to construction of littoral marsh = (m - h) / j =		0.24
										Incremental change as % of "pre-project" condition = (h - e) / e =		16.73%
											Total change ecological condition of Mine Area due to project = (m - h) =	-3,973.36 <\
											Total Unit per Acre change due to project = (m - h) / j =	-0.25 |
											Total change as % of "pre-project" condition = (h - e) / e =	-17.6% |

Table continues on next page

(continued on next page of Table)

Table B (part 2 of 2) Ecological assessment of 50 year plan using habitat evaluation in Final EIS (FEIS)

Table continued from previous page

(continued from previous page of Table)

		Within the Pennsuco Area					If additional mitigation lands restored are similar to Pennsuco			
		Subtotal Acres in Pennsuco	Current Condition		After Restoration		Multiplier	Resulting acres	Resulting Habitat Units	
			Units/Acre pre-project	Quantity of Habitat Units	Units/Acre post-project	Quantity of Habitat Units				
		b	r	s	t	u	v	w	x	
		Table 7.1-2	*Table 3.12-3*	*s = r * b*	*Table 7.1-1*	*u = t * b*	*(see note)*	*w = v * b*	*x = v * u*	
	Natural Covertypes									
P	Prairie	5,862.77	0.98	5,745.51	0.98	5,745.51				
P50	Prairie w/ Mel (10-50%)	1,899.99	0.90	1,709.99	0.98	1,861.99				
P75	Prairie w/ Mel (50-75%)	2,090.85	0.72	1,505.41	0.98	2,049.03				
DM	Dense Melaleuca	1,779.80	0.42	747.52	0.98	1,744.20				
DMS	Dense Mel Saplings	101.27	0.44	44.56	0.98	99.24				
TI	Tree Islands	60.61	0.91	55.16	1.00	60.61				
WH	Willow Heads	25.78	0.95	24.49	1.00	25.78				
	Pond Apple	0.00	0.92	0.00	1.00	0.00				
	Man-Altered Covers									
D	Disturbed (Forest&Open)	112.36	0.50	56.18	0.98	110.11				
DP	Disturbed Prairie	0.00	0.69	0.00	0.98	0.00				
DP50	Dist Pra w/Mel (10-50%)	0.00	0.67	0.00	0.98	0.00				
DP75	Dist Pra w/Mel (50-75%)	0.00	0.62	0.00	0.98	0.00				
C	Canals	91.18	0.37	33.74	0.37	33.74				
LP	Lake Perimeter	0.00	0.04	0.00	0.98	0.00				
WH	Other Water/Impoundmt	5.44	0.31	1.69	0.26	1.41				
AG	Agriculture	0.00	0.17	0.00	0.17	0.00				
FPL	FPL Transmission	0.00	0.64	0.00	0.67	0.00				
DV	Developed	89.00	0.06	5.34	0.06	5.34				
	Mining									
L	Lakes	4.76	0.21	1.00	0.21	1.00				
L	New lakes @ 640.0 ac									
	DeepCut @ 592.43 ac									
	Littoral @ 45.7 ac									
Total Acres		12,123.81					2.20	26,652.81		
Total Ecological Units				9,930.58		11,737.98				
	Change ecological condition of Pennsuco = (u - s) =					1,807.40	2.20		3,973.36	
	Unit per Acre change due to project = (u - s) / b =					0.15				
	Change as % of "pre-project" condition = (u - s) / s =					18.20%				

Quantity of Units gained in Pennsuco Area equals the quantity lost in the Mining Area

Notes:

"Round-off" = difference between this spreadsheet and the FEIS table.

Column "b" = Pennsuco Acres, Sum of FEIS Tables 7.1-2 (West) & 7.1-3 (East)

Column "d" = FEIS Table 3.12-3. Lake unit/acre = 0.00 until mining operation finished.

Column "f" = Due to round off, total mining acres shown here is 0.27 acres more then FEIS Table 6.6-1

Column "j" = Constructed after mining ceases. Acres based on generic 1 mile square property.

Column "v" = Presumption is additional lands outside Pennsuco will be acquired & restored.

Table C Unit/acre calculation using Greenbook/WRAP approach.

Greenbook = Chapter 5 of Joint State Federal Mitigation Bank Review Team Process for Florida, October 1998.

Unit/Acre = [(WU/3)*WTwu] + [(OS/3)*WTos] + [(GC/3)*WTgc] + [(BF/3)*WTbf] + [(HY/3)*WThy] + [(WQ/3)*WTwq]

	WU Wildlife Utilization	OS Overstory /Shrub	GC Ground Cover	BF Up/Wet Buffer	HY Hydro- -logy	WQ Water Quality
(P) Prairie						
Without-Project (existing) condition sub-scores	2.0	na	2.5	2.5	2.5	2.98
Unit/Acre Existing Condition			0.791			
With-Project (expected restored) sub-scores	2.5	na	3	2.5	2.5	3
Unit/Acre Expected Condition			0.908			
(P50) Prairie w/ Melaleuca (10-50%)						
Without-Project (existing) condition sub-scores	2.0	1.0	2.0	2.5	2.5	2.98
Unit/Acre Existing Condition			0.692			
With-Project (expected restored) sub-scores	2.5	na	3	2.5	2.5	3
Unit/Acre Expected Condition			0.908			
(P75) Prairie w/ Melaleuca (50-75%)						
Without-Project (existing) condition sub-scores	2.5	0.5	1.0	2.5	2.5	2.98
Unit/Acre Existing Condition			0.623			
With-Project (expected restored) sub-scores	2.5	na	3	2.5	2.5	3
Unit/Acre Expected Condition			0.908			
(DM) Dense Melaleuca						
Without-Project (existing) condition sub-scores	2.0	0.0	0.0	2.5	2.0	2.80
Unit/Acre Existing Condition			0.424			
With-Project (expected restored) sub-scores	2.5	na	3	2.5	2.5	3
Unit/Acre Expected Condition			0.908			
(DMS) Dense Melaleuca Saplings						
Without-Project (existing) condition sub-scores	2.0	0.0	0.5	2.5	2.0	2.98
Unit/Acre Existing Condition			0.484			
With-Project (expected restored) sub-scores	2.5	na	3	2.5	2.5	3
Unit/Acre Expected Condition			0.908			
(AG) Agriculture (farmed wetland)						
Without-Project (existing) condition sub-scores	1.0	na	0.5	1.5	1.5	1.75
Unit/Acre Existing Condition			0.333			
With-Project (expected restored) sub-scores	2.5	na	3	2.5	2.5	3
Unit/Acre Expected Condition			0.908			
(L) Littoral area of excavated pits ("lakes") created from bare rock after completion of mining operations.						
Without-Project (existing) condition sub-scores	0.0	na	0.0	0.0	0.0	0.00
Unit/Acre Existing Condition			0.000			
With-Project (expected restored) sub-scores	1	na	2.5	0.5	2	2
Unit/Acre Expected Condition			0.558			
(L) Nearshore area of excavated pits (within 200 feet of perimeter/littoral area)						
Without-Project (existing) condition sub-scores	0.0	na	0.0	0.0	0.0	0.00
Unit/Acre Existing Condition			0.000			
With-Project (expected restored) sub-scores	0.5	na	0.0	1.0	0.0	1.0
Unit/Acre Expected Condition			0.125			
(WT) Weighting Variable Scoring						
a. Project results in identifable ecological benefits to issues established for this watershed?						
Yes=3 No=0	3	0	3	0	0	0
Discussion: Lake-Belt valued for wildlife utilization and ground cover vegetation characteristic of Everglades. Melaleuca is thereby not valued so is given less weight in calculating the unit/acre assessment. Therefore, credit is not given twice for removing Overstory then again for Ground Cover.						
b. 'Project will result in identifiable ecological benefits to adjacent lands / waters of regional importance?	3	0	3	0	0	0
Improves status of federal and/or state listed threatened or endangered or federal candidate species? Increases population=3 Meets identified tasks in recovery plan=2 Attracts listed species=1	1	0	1	0	0	0
Discussion: Characteristics captured in the WU and GC scores especially reflect value for wood stork.						
c. Restores or creates ecological features considered to be unusual, unique or rare?						
Yes=3 No=0	0	0	0	0	0	0
d. Any special circumstances considered in the weighting?	0	0	0	0	0	0
Variable name	WTwu	WTos	WTgc	WTbf	WThy	WTwq
WT if overstory present = 1/6 + (a+b+c+d)/14 =	0.333	0.083	0.333	0.083	0.083	0.083
WT if no overstory = 1/5 + (a+b+c+d)/14 =	0.350	na	0.350	0.100	0.100	0.100

Table D (part 1 of 3) Ecological assessment of 50 year plan using the Greenbook/WRAP approach.

This calculation based on all of the impact and mitigation performed in one year. Adjustments for time lag, etc., shown in Table E and others.

		Inventory of Land Covers ca. 1992		Within the Mine Area (Lake Belt Study Area minus Pennsuco)									
				"Pre-project" Conditon of Mine Area				Ecological Condition after Mining			Condition after Littoral Marshes Built		
		Acres EIS Study Area	Subtotal in Pennsuco	Subtotal in Mine Area	Units/Acre	(see notes)	Quantity of Habitat Units	Change due to mining	Resulting Landcover	Quantity of Habitat Units	Change due to marshes	Resulting Landcover	Quantity of Habitat Units
		a	b	c	d		e	f	g	h	j	k	m
		Table 3.10-1	*Table 7.1-2*	*c = a - b*	*Table C*		*e = d * c*	*Table 6.6-1*	*g = c + f*	*h = d * g*	*(see note)*	*k = g + j*	*m = d * k*
Natural Covertypes													
P	Prairie	12,598.69	5,862.77	6,735.92	0.791		5,328.11	-944.37	5,791.55	4,581.12		5,791.55	4,581.12
P50	Prairie w/ Mel (10-50%)	5,065.26	1,899.99	3,165.27	0.692		2,191.78	-1,409.45	1,755.82	1,215.81		1,755.82	1,215.81
P75	Prairie w/ Mel (50-75%)	4,220.22	2,090.85	2,129.37	0.623		1,326.84	-1,209.22	920.15	573.36		920.15	573.36
DM	Dense Melaleuca	11,923.10	1,779.80	10,143.30	0.424		4,300.42	-4,991.62	5,151.68	2,184.14		5,151.68	2,184.14
DMS	Dense Mel Saplings	6,642.83	101.27	6,541.56	0.484		3,169.04	-3,419.46	3,122.10	1,512.49		3,122.10	1,512.49
TI	Tree Islands	346.07	60.61	285.46	0.000	(1)	0.00	-88.99	196.47	0.00		196.47	0.00
WH	Willow Heads	25.78	25.78	0.00	0.000	(2)	0.00	0.00	0.00	0.00		0.00	0.00
	Pond Apple	14.82	0.00	14.82	0.000	(2)	0.00	0.00	14.82	0.00		14.82	0.00
Man-Altered Covers													
D	Disturbed (Forest&Open)	2,627.02	112.36	2,514.66	0.000	(3)	0.00	-763.65	1,751.01	0.00		1,751.01	0.00
DP	Disturbed Prairie	19.10	0.00	19.10	0.000	(2)	0.00	0.00	19.10	0.00		19.10	0.00
DP50	Dist Pra w/Mel (10-50%)	414.39	0.00	414.39	0.346	(4)	143.47	-269.12	145.27	50.30		145.27	50.30
DP75	Dist Pra w/Mel (50-75%)	216.81	0.00	216.81	0.312	(5)	67.55	-146.22	70.59	21.99		70.59	21.99
C	Canals	438.96	91.18	347.78	0.000	(6)	0.00	-25.67	322.11	0.00		322.11	0.00
LP	Lake Perimeter	1,666.91	0.00	1,666.91	0.000	(7)	0.00	-972.32	694.59	0.00		694.59	0.00
WH	Other Water/Impoundmt	542.66	5.44	537.22	0.000	(8)	0.00	-208.14	329.08	0.00		329.08	0.00
AG	Agriculture	3,336.56	0.00	3,336.56	0.333	(9)	1,112.19	-1,327.52	2,009.04	669.68		2,009.04	669.68
FPL	FPL Transmission	718.87	0.00	718.87	0.000	(6)	0.00	-18.50	700.37	0.00		700.37	0.00
DV	Developed	1,771.18	89.00	1,682.18	0.000	(1)	0.00	-76.56	1,605.62	0.00		1,605.62	0.00
Mining													
L	Existing Lakes	4,926.22	4.76	4,921.46	0.00		0.00		4,921.46	0.00	0.00	4,921.46	0.00
L	New lakes @ 640ac							15,870.81	15,870.81	0.00	-15,870.81		
	Lake center @ 502.8				0.00			(see note for column "f")			12,468.75	12,468.75	0.00
	NearShore @ 89.6 ac				0.125						2,222.50	2,222.50	277.81
	Littoral @ 45.7 ac				0.558						1,179.56	1,179.56	658.59
Total Acres		57,515.45	12,123.81	45,391.64					45,391.64			45,391.64	
Total Ecological Units							17,639.40			10,808.89			11,745.29
				Incremental change ecological condition due to mining = (h - e) =						-6,830.51			
				Incremental Unit per Acre change due to mining = (h - e) / f =						-0.43			
				Incremental change as % of "pre-project" condition = (h - e) / e =						-38.7%			
											Incremental change ecological condition due to construction of littoral marsh = (m - h) =		936.40
											Incremental Unit per Acre change due to construction of littoral marsh = (m - h) / j =		0.06
											Incremental change as % of "pre-project" condition = (h - e) / e =		5.31%
											Total change ecological condition of Mine Area due to project = (m - h) =		-5,894.11
											Total Unit per Acre change due to project = (m - h) / j =		-0.37
											Total change as % of "pre-project" condition = (h - e) / e =		-33.4%

Table continues on next page

(continued on next page of Table)

Table D (part 2 of 3) Ecological Assessment of Fifty Year Plan Using the Greenbook/WRAP Approach.

Table continued from previous page

(continued from previous page of Table)

		Within the Pennsuco Area					If additional mitigation lands restored are similar to Pennsuco			
		Subtotal Acres in Pennsuco	Current Condition			After Restoration				
			Units/Acre pre-project	(see notes)	Quantity of Habitat Units	Units/Acre post-project	Quantity of Habitat Units	Multiplier	Resulting acres	Resulting Habitat Units
		b	r		s	t	u	v	w	x
		Table 7.1-2	*Table C*		*s = r * b*	*Table C*	*u = t * b*	*(see note)*	*w = v * b*	*x = v * u*
	Natural Covertypes									
P	Prairie	5,862.77	0.791		4,637.45	0.908	5,325.35			
P50	Prairie w/ Mel (10-50%)	1,899.99	0.692		1,315.64	0.908	1,725.82			
P75	Prairie w/ Mel (50-75%)	2,090.85	0.623		1,302.84	0.908	1,899.19			
DM	Dense Melaleuca	1,779.80	0.424		754.58	0.908	1,616.65			
DMS	Dense Mel Saplings	101.27	0.484		49.06	0.908	91.99			
TI	Tree Islands	60.61	0.000	(1)	0.00	0.000	0.00			
WH	Willow Heads	25.78	0.000	(c)	0.00	0.000	0.00			
	Pond Apple	0.00	0.000	(b)	0.00	0.000	0.00			
	Man-Altered Covers									
D	Disturbed (Forest&Open)	112.36	0.00	(a)	0.00	0.00	0.00			
DP	Disturbed Prairie	0.00	0.00	(b)	0.00	0.00	0.00			
DP50	Dist Pra w/Mel (10-50%)	0.00	0.00	(b)	0.00	0.00	0.00			
DP75	Dist Pra w/Mel (50-75%)	0.00	0.00	(b)	0.00	0.00	0.00			
C	Canals	91.18	0.00	(c)	0.00	0.00	0.00			
LP	Lake Perimeter	0.00	0.00	(b)	0.00	0.00	0.00			
WH	Other Water/Impoundmt	5.44	0.00	(a)	0.00	0.00	0.00			
AG	Agriculture	0.00	0.00	(b)	0.00	0.00	0.00			
FPL	FPL Transmission	0.00	0.00	(b)	0.00	0.00	0.00			
DV	Developed	89.00	0.00	(c)	0.00	0.00	0.00			
	Mining									
L	Lakes	4.76	0.00	(c)	0.00	0.00	0.00			
L	New lakes @ 640ac									
	Lake center @ 502.8									
	NearShore @ 89.6 ac		0.00	(b)		0.00				
	Littoral @ 45.7 ac		0.00	(b)		0.00				
Total Acres		12,123.81						2.27	27,490.22	
Total Ecological Units					8,059.57		10,659.00			
	Change ecological condition of Pennsuco = (u - s) =						2,599.44	2.27		5,894.11
	Unit per Acre change due to project = (u - s) / b =						0.21			
	Change as % of "pre-project" condition = (u - s) / s =						32.25%			

Quantity of Units gained in Pennsuco Area equals the quantity lost in the Mining Area

Notes:

Greenbook/WRAP Approach = Chapter 5 of the "Joint State/Federal Mitigation Bank Review Team Process for Florida", October 1998.

"Round-off" = difference between this spreadsheet and the FEIS table.

Column "b" = Pennsuco Acres, Sum of FEIS Tables 7.1-2 (West) & 7.1-3 (East)

Column "d" = From Table C (Greenbook/WRAP units/acre). Lake unit/acre = 0.00 until mining operation finished.

Column "f" = Due to round off, total mining acres shown here is 0.27 acres more then FEIS Table 6.6-1

Column "j" = Constructed after mining ceases. Acres based on generic 1 mile square property.

Column "v" = Presumption is additional lands outside Pennsuco will be acquired & restored.

Notes continue on next page

Table D (part 3 of 3) Ecological Assessment of Fifty Year Plan Using the Greenbook/WRAP Approach.

Notes continued from previous page

Notes:

(1) Not included in calculation since is upland and mining will avoid these (acres based on GIS simplified mining footprint.)
(2) Not included in calculation since proposed mining is not impacting any of this covertype so a Unit/Acre not developed.
(3) Not included in calculation since these are mostly upland berms and spoil piles that are not wetland.
(4) Unit/Acre not developed due to very small acres to be impacted by mining. Used 50% of P50 recognizing is "disturbed"
(5) Unit/Acre not developed due to very small acres to be impacted by mining. Used 50% of P75 recognizing is "disturbed"
(6) Not included in calculation since unlikely mining will actually impact this (acres based on GIS simplified mine footprint)
(7) Unit/Acre = zero since these are unvegetated/cleared pads, roads, etc., from mine workings.
(8) Unit/Acre = zero since these are mine work areas that had surface water pond.
(9) Used scoring from a farmed wetland from non-mining permit application in the vicinity. Not all agricultural is wetland!
(a) Unit/Acre not developed due to small quantity and since these berms, etc. may not be restored due to location.
(b) Unit/Acre not developed since none is present in the Pennsuco.
(c) Unit/Acre not developed since unlikely will be part of restoration action.

Table E (Part 1 of 2) Ecological Assessment based on estimated pace of mining and restoration.

		Change due to mining				Change due to Littoral construction				Restoring Pennsuco & other areas				Cumulative					
Year	Yr	Acres mined	increment unit/acre	Units Impact	Present Worth	Acres built	increment unit/acre	Units restored	Present Worth	Restored Acres	Unit/acre change	Units restored	Present Worth	Acres		Units		Present Worth	
														Impacted	Restored	Impacted	Restored	Impacted	Restored
a	b	c	d	e	f	g	h	j	k	m	n	o	p	q	r	s	t	u	v
		(note 1)	*(note4)*	*(note6)*	*(note5)*	*(note 2)*	*(note7)*	*(note6)*	*(note5)*	*(note 3)*	*(note4)*	*o=m*n*	*(note5)*	*(note6)*	*(note7)*				
	0		-0.4304				0.5583				0.2144			*q=c+q'*	*r=g+m+r'*	*s=e+s'*	*t=j+o+t'*	*u=f+u'*	*v=k+p+v'*
1999	1	*(note 8)*	-0.4289	*(note 8)*	0.00	0.0	0.5583	0.00	0.00	0.0	0.2195	0.00	0.00	*(note 8)*	0	*(note 8)*	0	*(note 8)*	0
2000	2	*(note 8)*	-0.4274	*(note 8)*	0.00	0.0	0.5583	0.00	0.00	0.0	0.2246	0.00	0.00	*(note 8)*	0	*(note 8)*	0	*(note 8)*	0
2001	3	*(note 8)*	-0.4259	*(note 8)*	0.00	0.0	0.5583	0.00	0.00	0.0	0.2297	0.00	0.00	*(note 8)*	0	*(note 8)*	0	*(note 8)*	0
2002	4	331.5	-0.4245	-152.01	-135.06	0.0	0.5583	0.00	0.00	163.8	0.2348	38.44	34.16	358	164	-152	38	-135	34
2003	5	331.5	-0.4230	-151.48	-130.67	0.0	0.5583	0.00	0.00	176.3	0.2398	42.27	36.47	716	340	-303	81	-266	71
2004	6	331.5	-0.4215	-150.95	-126.42	0.0	0.5583	0.00	0.00	188.8	0.2449	46.23	38.72	1,074	529	-454	127	-392	109
2005	7	331.5	-0.4200	-150.42	-122.31	0.0	0.5583	0.00	0.00	263.8	0.2500	65.94	53.62	1,432	793	-605	193	-514	163
2006	8	331.5	-0.4186	-149.89	-118.33	0.0	0.5583	0.00	0.00	263.8	0.2551	67.29	53.12	1,791	1,056	-755	260	-633	216
2007	9	331.5	-0.4171	-149.36	-114.48	0.0	0.5583	0.00	0.00	263.8	0.2602	68.63	52.60	2,149	1,320	-904	329	-747	269
2008	10	331.5	-0.4156	-148.83	-110.75	0.0	0.5583	0.00	0.00	263.8	0.2653	69.97	52.06	2,507	1,584	-1,053	399	-858	321
2009	11	331.5	-0.4141	-148.31	-107.14	0.0	0.5583	0.00	0.00	263.8	0.2704	71.31	51.52	2,865	1,848	-1,201	470	-965	372
2010	12	331.5	-0.4126	-147.78	-103.65	0.0	0.5583	0.00	0.00	291.3	0.2755	80.23	56.27	3,223	2,139	-1,349	550	-1,069	429
2011	13	331.5	-0.4112	-147.25	-100.27	0.0	0.5583	0.00	0.00	311.3	0.2806	87.32	59.46	3,581	2,450	-1,496	638	-1,169	488
2012	14	330.5	-0.4097	-146.28	-96.71	0.0	0.5583	0.00	0.00	373.8	0.2856	106.76	70.58	3,938	2,824	-1,643	744	-1,266	559
2013	15	330.5	-0.4082	-145.75	-93.55	0.0	0.5583	0.00	0.00	503.8	0.2907	146.46	94.00	4,295	3,328	-1,788	891	-1,359	653
2014	16	330.5	-0.4067	-145.22	-90.50	0.0	0.5583	0.00	0.00	503.8	0.2958	149.02	92.86	4,652	3,831	-1,934	1,040	-1,450	745
2015	17	330.5	-0.4053	-144.69	-87.54	0.0	0.5583	0.00	0.00	528.8	0.3009	159.11	96.26	5,009	4,360	-2,078	1,199	-1,537	842
2016	18	330.5	-0.4038	-144.16	-84.68	0.0	0.5583	0.00	0.00	638.8	0.3060	195.46	114.81	5,366	4,999	-2,222	1,394	-1,622	957
2017	19	330.5	-0.4023	-143.64	-81.91	0.0	0.5583	0.00	0.00	563.8	0.3111	175.37	100.01	5,723	5,563	-2,366	1,570	-1,704	1,057
2018	20	330.5	-0.4008	-143.11	-79.24	0.0	0.5583	0.00	0.00	551.3	0.3162	174.29	96.50	6,080	6,114	-2,509	1,744	-1,783	1,153
2019	21	330.5	-0.3993	-142.58	-76.64	0.0	0.5583	0.00	0.00	538.8	0.3213	173.08	93.04	6,437	6,653	-2,652	1,917	-1,860	1,246
2020	22	330.5	-0.3979	-142.05	-74.14	0.0	0.5583	0.00	0.00	513.8	0.3263	167.66	87.50	6,794	7,166	-2,794	2,085	-1,934	1,334
2021	23	330.5	-0.3964	-141.53	-71.71	0.0	0.5583	0.00	0.00	513.8	0.3314	170.28	86.28	7,151	7,680	-2,935	2,255	-2,006	1,420
2022	24	330.5	-0.3949	-141.00	-69.36	0.0	0.5583	0.00	0.00	538.8	0.3365	181.30	89.19	7,508	8,219	-3,076	2,436	-2,075	1,509
2023	25	330.5	-0.3934	-140.47	-67.09	0.0	0.5583	0.00	0.00	558.8	0.3416	190.88	91.16	7,866	8,778	-3,217	2,627	-2,142	1,600
2024	26	330.5	-0.3920	-139.94	-64.89	0.0	0.5583	0.00	0.00	638.8	0.3467	221.46	102.69	8,223	9,416	-3,357	2,849	-2,207	1,703
2025	27	275.0	-0.3905	-116.00	-52.22	0.0	0.5583	0.00	0.00	646.3	0.3518	227.34	102.35	8,520	10,063	-3,473	3,076	-2,259	1,805
2026	28	295.5	-0.3890	-124.18	-54.28	0.0	0.5583	0.00	0.00	658.8	0.3569	235.09	102.75	8,839	10,721	-3,597	3,311	-2,314	1,908
2027	29	326.2	-0.3875	-136.56	-57.95	0.0	0.5583	0.00	0.00	793.8	0.3620	287.31	121.92	9,191	11,515	-3,733	3,599	-2,371	2,030
2028	30	308.5	-0.3860	-128.66	-53.01	0.0	0.5583	0.00	0.00	771.3	0.3671	283.09	116.63	9,524	12,286	-3,862	3,882	-2,424	2,147
2029	31	252.5	-0.3846	-104.90	-41.96	0.0	0.5583	0.00	0.00	631.3	0.3721	234.92	93.96	9,797	12,918	-3,967	4,117	-2,466	2,240
2030	32	247.5	-0.3831	-102.43	-39.78	0.0	0.5583	0.00	0.00	618.8	0.3772	233.41	90.64	10,065	13,536	-4,069	4,350	-2,506	2,331

Table continues on next page

Table E (Part 2 of 2) Ecological Assessment based on estimated pace of mining and restoration.

Table continued from previous page

		Change due to mining				Change due to Littoral construction				Restoring Pennsuco & other areas				Cumulative					
Year	Yr	Acres mined	increment unit/acre	Units Impact	Present Worth	Acres built	increment unit/acre	Units restored	Present Worth	Restored Acres	Unit/acre change	Units restored	Present Worth	Acres Impacted	Acres Restored	Units Impacted	Units Restored	Present Worth Impacted	Present Worth Restored
a	b	c	d	e	f	g	h	j	k	m	n	o	p	q	r	s	t	u	v
		(note 1)	*(note4)*	*(note6)*	*(note5)*	*(note 2)*	*(note7)*	*(note6)*	*(note5)*	*(note 3)*	*(note4)*	*o=m*n*	*(note5)*	*(note6)*	*(note7)*				
2031	33	247.5	-0.3816	-102.03	-38.47	0.0	0.5583	0.00	0.00	618.8	0.3823	236.56	89.19	10,332	14,155	-4,171	4,586	-2,545	2,420
2032	34	252.5	-0.3801	-103.69	-37.96	0.0	0.5583	0.00	0.00	631.3	0.3874	244.55	89.52	10,605	14,786	-4,275	4,831	-2,583	2,510
2033	35	252.5	-0.3787	-103.29	-36.71	0.0	0.5583	0.00	0.00	631.3	0.3925	247.76	88.05	10,878	15,418	-4,378	5,079	-2,619	2,598
2034	36	252.5	-0.3772	-102.89	-35.50	0.0	0.5583	0.00	0.00	631.3	0.3976	250.98	86.59	11,150	16,049	-4,481	5,330	-2,655	2,684
2035	37	247.5	-0.3757	-100.45	-33.65	0.0	0.5583	0.00	0.00	618.8	0.4027	249.15	83.46	11,418	16,668	-4,582	5,579	-2,688	2,768
2036	38	237.5	-0.3742	-96.02	-31.23	0.0	0.5583	0.00	0.00	593.8	0.4078	242.11	78.74	11,674	17,261	-4,678	5,821	-2,720	2,847
2037	39	233.0	-0.3728	-93.82	-29.63	0.0	0.5583	0.00	0.00	582.5	0.4128	240.48	75.93	11,926	17,844	-4,772	6,062	-2,749	2,923
2038	40	231.0	-0.3713	-92.65	-28.40	0.0	0.5583	0.00	0.00	577.5	0.4179	241.36	73.99	12,175	18,421	-4,864	6,303	-2,778	2,997
2039	41	235.5	-0.3698	-94.08	-28.00	0.0	0.5583	0.00	0.00	588.8	0.4230	249.06	74.13	12,430	19,010	-4,958	6,552	-2,806	3,071
2040	42	235.5	-0.3683	-93.70	-27.08	0.0	0.5583	0.00	0.00	588.8	0.4281	252.05	72.83	12,684	19,599	-5,052	6,804	-2,833	3,144
2041	43	235.5	-0.3668	-93.33	-26.18	0.0	0.5583	0.00	0.00	588.8	0.4332	255.05	71.55	12,939	20,188	-5,145	7,059	-2,859	3,215
2042	44	235.5	-0.3654	-92.95	-25.32	0.0	0.5583	0.00	0.00	588.8	0.4383	258.04	70.28	13,193	20,776	-5,238	7,317	-2,884	3,285
2043	45	235.5	-0.3639	-92.58	-24.48	0.0	0.5583	0.00	0.00	588.8	0.4434	261.04	69.03	13,448	21,365	-5,331	7,578	-2,909	3,354
2044	46	235.5	-0.3624	-92.20	-23.67	0.0	0.5583	0.00	0.00	588.8	0.4485	264.04	67.79	13,702	21,954	-5,423	7,842	-2,932	3,422
2045	47	235.5	-0.3609	-91.82	-22.89	0.0	0.5583	0.00	0.00	588.8	0.4536	267.03	66.56	13,956	22,543	-5,515	8,109	-2,955	3,489
2046	48	228.5	-0.3595	-88.73	-21.47	0.0	0.5583	0.00	0.00	571.3	0.4586	262.00	63.40	14,203	23,114	-5,604	8,371	-2,977	3,552
2047	49	124.8	-0.3580	-48.26	-11.34	0.0	0.5583	0.00	0.00	312.0	0.4637	144.68	33.99	14,338	23,426	-5,652	8,516	-2,988	3,586
	50		-0.3565				0.5583				0.4688								
Sum Acres		13,272.50				0.00				23,425.75									
Sum Units				-5,651.94				0.00				8,515.87							
Sum Present Worth					-2,988.17				0.00				3,586.18						

Projected Mitigation Ratios

Acres Restored : Acres Mined =	1.76
Units Restored : Units lost from mining =	1.51
Present Worth Units Restored : PW Units Mining =	1.20

Notes:

(1) Estimated pace of mining based on projections in Table A.

(2) Pace of littoral area creation difficult to project due to unknowns related to wellfield protection and for coordination with CERP so not included at this time.

(3) Estimated pace of acquisiton and restoration of Pennsuco and other lands based on projections in Table A.

(4) Unit/Acre values shown at Year 0 are the "incremental unit/acre" figures of Table D.
Values at Year 50 from a recalculated Table D with dense melaleuca covering entire area.
Values for other years based on assumption melalecua will cover entire area linearly in 50 years.
Note that FEIS Section 3.10.2 reports expansion is exponential about 20 years.

(5) Present Worth of Units in Year x = Units/(1.03)^year = Temporal Lags between time impacts occur and restoration/creation provided. For calcuation ease, convert all to Present Worth at Year 0.

(6) Deep-cut acres in Table A increased to encompass acres cleared for littoral/work areas.

(7) Presumption is additional lands outside Pennsuco will be acquired & restored.

(8) Impacts prior to issuance of new permits in 2002 not included since done under previous permits.

Table F1 What if … Assessment based on 10 year footprint mix of vegetation instead of the 50 year footprint?

Same as "Table D (Part 1)" except using the distribution of land covers to be impacted by the mining of the "ten year" footprint.
This calculation based on all of the impact and mitigation performed in one year. Adjustments for time lag, etc., shown in Table E and others.

		Inventory of Land Covers ca. 1992		Within the Mine Area (Lake Belt Study Area minus Pennsuco)								
				"Pre-project" Conditon of Mine Area				Ecological Condition after Mining			Condition after Littoral Marshes Built		
		Acres EIS Study Area	Subtotal in Pennsuco	Subtotal in Mine Area	Units/Acre	(see notes)	Quantity of Habitat Units	Change due to mining	Resulting Landcover	Quantity of Habitat Units	Change due to marshes	Resulting Landcover	Quantity of Habitat Units
		a	b	c	d		e	f	g	h	j	k	m
		Table 3.10-1	*Table 7.1-2*	*c = a - b*	*Table C*		*e = d * c*	*BRA*	*g = c + f*	*h = d * g*	*(see note)*	*k = g + j*	*m = d * k*
Natural Covertypes													
P	Prairie	12,598.69	5,862.77	6,735.92	0.791		5,328.11	-476.70	6,259.22	4,951.04		6,259.22	4,951.04
P50	Prairie w/ Mel (10-50%)	5,065.26	1,899.99	3,165.27	0.692		2,191.78	-316.70	2,848.57	1,972.48		2,848.57	1,972.48
P75	Prairie w/ Mel (50-75%)	4,220.22	2,090.85	2,129.37	0.623		1,326.84	-380.60	1,748.77	1,089.68		1,748.77	1,089.68
DM	Dense Melaleuca	11,923.10	1,779.80	10,143.30	0.424		4,300.42	-1,810.32	8,332.98	3,532.91		8,332.98	3,532.91
DMS	Dense Mel Saplings	6,642.83	101.27	6,541.56	0.484		3,169.04	-1,114.80	5,426.76	2,628.98		5,426.76	2,628.98
TI	Tree Islands	346.07	60.61	285.46	0.000	(1)	0.00	-19.80	265.66	0.00		265.66	0.00
WH	Willow Heads	25.78	25.78	0.00	0.000	(2)	0.00	0.00	0.00	0.00		0.00	0.00
	Pond Apple	14.82	0.00	14.82	0.000	(2)	0.00	0.00	14.82	0.00		14.82	0.00
Man-Altered Covers													
D	Disturbed (Forest&Open)	2,627.02	112.36	2,514.66	0.000	(3)	0.00	-279.60	2,235.06	0.00		2,235.06	0.00
DP	Disturbed Prairie	19.10	0.00	19.10	0.000	(2)	0.00	0.00	19.10	0.00		19.10	0.00
DP50	Dist Pra w/Mel (10-50%)	414.39	0.00	414.39	0.346	(4)	143.47	-58.00	356.39	123.39		356.39	123.39
DP75	Dist Pra w/Mel (50-75%)	216.81	0.00	216.81	0.312	(5)	67.55	-2.30	214.51	66.83		214.51	66.83
C	Canals	438.96	91.18	347.78	0.000	(6)	0.00	-16.80	330.98	0.00		330.98	0.00
LP	Lake Perimeter	1,666.91	0.00	1,666.91	0.000	(7)	0.00	-256.50	1,410.41	0.00		1,410.41	0.00
WH	Other Water/Impoundmt	542.66	5.44	537.22	0.000	(8)	0.00	-82.80	454.42	0.00		454.42	0.00
AG	Agriculture	3,336.56	0.00	3,336.56	0.333	(9)	1,112.19	-485.10	2,851.46	950.49		2,851.46	950.49
FPL	FPL Transmission	718.87	0.00	718.87	0.000	(6)	0.00	-8.60	710.27	0.00		710.27	0.00
DV	Developed	1,771.18	89.00	1,682.18	0.000	(1)	0.00	-46.00	1,636.18	0.00		1,636.18	0.00
Mining													
L	Existing Lakes	4,926.22	4.76	4,921.46	0.00		0.00	-54.7	4,866.76	0.00	0.00	4,866.76	0.00
L	New lakes @ 640ac							5,409.32	5,409.32	0.00	-5,409.32		
	Lake center @ 502.8				0.00						4,249.78	4,249.78	0.00
	NearShore @ 89.6 ac				0.125						757.50	757.50	94.69
	Littoral @ 45.7 ac				0.558						402.04	402.04	224.47
Total Acres		57,515.45	12,123.81	45,391.64					45,391.64			45,391.64	
Total Ecological Units							17,639.40			15,315.80			15,634.96
								Incremental change ecological condition due to mining = (h - e) =		-2,323.60			
								Incremental Unit per Acre change due to mining = (h - e) / f =		-0.43			
								Incremental change as % of "pre-project" condition = (h - e) / e =		-13.2%			
											Incremental change ecological condition due to construction of littoral marsh = (m - h) =		319.16
											Incremental Unit per Acre change due to construction of littoral marsh = (m - h) / j =		0.06
											Incremental change as % of "pre-project" condition = (h - e) / e =		1.81%
											Total change ecological condition of Mine Area due to project = (m - h) =		-2,004.44
											Total Unit per Acre change due to project = (m - h) / j =		-0.37
											Total change as % of "pre-project" condition = (h - e) / e =		-11.4%

Compare 10 year mix of land cover to 50 year mix		
compare "Incremental Unit per Acre change due to mining"		
(at bottom of Column "h")	as shown	to 4 digits
	n	o
Table D1 (50 year plan)	-0.43	-0.4304
Table F1 (10 year plan)	-0.43	-0.4296
Difference (10 year very slightly less)		-0.0008
Percent of 50 year plan		**0.19%**

Notes:

All other notes, except for column "f", are the same as for Table D

Column "f" = From tabulation by Biological Research Associates for the permit footprint.

Table F2 What if...no mining authorized beyond 10 Year Footprint?

Same as Table E but using the total acres authorized by the permit drawings (this includes the cross-hatched areas near the wellfield)

		Change due to mining				Change due to Littoral construction				Restoring Pennsuco & other areas				Cumulative					
Year	Yr	Acres mined	increment unit/acre	Units Impact	Present Worth	Acres built	increment unit/acre	Units restored	Present Worth	Restored Acres	Unit/acre change	Units restored	Present Worth	Acres Impacted	Acres Restored	Units Impacted	Units Restored	Present Worth Impacted	Present Worth Restored
a	b	c	d	e	f	g	h	j	k	m	n	o	p	q	r	s	t	u	v
		(note 1)	*(note4)*	*(note6)*	*(note5)*	*(note 2)*	*(note7)*	*(note6)*	*(note5)*	*(note 3)*	*(note4)*	*o=m*n*	*(note5)*	*(note6)*	*(note7)*				
	0		-0.4304				0.5583				0.2144			*q=c+q'*	*r=g+m+r'*	*s=e+s'*	*t=j+o+t'*	*u=f+u'*	*v=k+p+v'*
1999	1	*(note 8)*	-0.4289	*(note 8)*	0.00	0.0	0.5583	0.00	0.00	0.0	0.2195	0.00	0.00	*(note 8)*	0	*(note 8)*	0	*(note 8)*	0
2000	2	*(note 8)*	-0.4274	*(note 8)*	0.00	0.0	0.5583	0.00	0.00	0.0	0.2246	0.00	0.00	*(note 8)*	0	*(note 8)*	0	*(note 8)*	0
2001	3	*(note 8)*	-0.4259	*(note 8)*	0.00	0.0	0.5583	0.00	0.00	0.0	0.2297	0.00	0.00	*(note 8)*	0	*(note 8)*	0	*(note 8)*	0
2002	4	331.5	-0.4245	-152.01	-135.06	0.0	0.5583	0.00	0.00	163.8	0.2348	38.44	34.16	358	164	-152	38	-135	34
2003	5	331.5	-0.4230	-151.48	-130.67	0.0	0.5583	0.00	0.00	176.3	0.2398	42.27	36.47	716	340	-303	81	-266	71
2004	6	331.5	-0.4215	-150.95	-126.42	0.0	0.5583	0.00	0.00	188.8	0.2449	46.23	38.72	1,074	529	-454	127	-392	109
2005	7	331.5	-0.4200	-150.42	-122.31	0.0	0.5583	0.00	0.00	263.8	0.2500	65.94	53.62	1,432	793	-605	193	-514	163
2006	8	331.5	-0.4186	-149.89	-118.33	0.0	0.5583	0.00	0.00	263.8	0.2551	67.29	53.12	1,791	1,056	-755	260	-633	216
2007	9	331.5	-0.4171	-149.36	-114.48	0.0	0.5583	0.00	0.00	263.8	0.2602	68.63	52.60	2,149	1,320	-904	329	-747	269
2008	10	331.5	-0.4156	-148.83	-110.75	0.0	0.5583	0.00	0.00	263.8	0.2653	69.97	52.06	2,507	1,584	-1,053	399	-858	321
2009	11	331.5	-0.4141	-148.31	-107.14	0.0	0.5583	0.00	0.00	263.8	0.2704	71.31	51.52	2,865	1,848	-1,201	470	-965	372
2010	12	331.5	-0.4126	-147.78	-103.65	0.0	0.5583	0.00	0.00	291.3	0.2755	80.23	56.27	3,223	2,139	-1,349	550	-1,069	429
2011	13	331.5	-0.4112	-147.25	-100.27	0.0	0.5583	0.00	0.00	311.3	0.2806	87.32	59.46	3,581	2,450	-1,496	638	-1,169	488
2012	14	330.5	-0.4097	-146.28	-96.71	0.0	0.5583	0.00	0.00	373.8	0.2856	106.76	70.58	3,938	2,824	-1,643	744	-1,266	559
2013	15	330.5	-0.4082	-145.75	-93.55	0.0	0.5583	0.00	0.00	503.8	0.2907	146.46	94.00	4,295	3,328	-1,788	891	-1,359	653
2014	16	330.5	-0.4067	-145.22	-90.50	0.0	0.5583	0.00	0.00	503.8	0.2958	149.02	92.86	4,652	3,831	-1,934	1,040	-1,450	745
2015	17	57.3	-0.4053	-25.08	-15.17	0.0	0.5583	0.00	0.00	91.6	0.3009	27.57	16.68	4,714	3,923	-1,959	1,067	-1,465	762
2016	18	0.0	-0.4038	0.00	0.00	350.4	0.5583	195.62	114.91	3,271.1	0.3060	1,000.95	587.95	4,714	7,544	-1,959	2,264	-1,465	1,465
	50		-0.3565				0.5583				0.4688								
Sum Acres		4,363.78				350.37				7,194.02									
Sum Units				-1,958.61				195.62				2,068.40							
Sum Present Worth					-1,464.98				114.91				1,350.07						

Projected Mitigation Ratios	
Acres Restored : Acres Mined =	1.73
Units Restored : Units lost from mining =	1.16
Present Worth Units Restored : PW Units Mining =	1.00

Notes:

(1) Estimated pace of mining based on projections in Table A. Year 2015 is the partial amount so total equals the "10 year plan" footprint.

(2) Presumtion is if expansion of the mining footprint is not authorized, then littoral marshes created in year after last of the mining.

(3) Estimated pace of acquisiton and restoration of Pennsuco based on projections in Table A, except Year 2015 is a partial amount.
Presumption is if expansion of footprint not authorized, then in Year 2016 sufficient lands in Pennsuco acquired so that Present Worth Ratio = 1:1

(4) Unit/Acre values shown at Year 0 are the "incremental unit/acre" figures of Table D.
Using Table D (50yr) units/acre instead of Table F1 since the unit/acre difference is so small.
Values at Year 50 from a recalculated Table D with dense melaleuca covering entire area.
Values for other years based on assumption melalecua will cover entire area linearly in 50 years.
Note that FEIS Section 3.10.2 reports expansion is exponential about 20 years.

(5) Present Worth of Units in Year x = Units/(1.03)^year = Temporal Lags between time impacts occur and restoration/creation provided. For calcuation ease, convert all to Present Worth at Year 0.

(6) Deep-cut acres in Table A increased to encompass acres cleared for littoral/work areas.

(7) Presumption is additional lands outside Pennsuco will be acquired & restored.

(8) Impacts prior to issuance of new permits in 2002 not included since done under previous permits.

Table F3 What if…calculate 10 year estimates based on splitting the area into "existing" and "new" mining areas?

This table splits the Mine Area into two parts. Table D did not have a split and calculated an average ecological units per acre for the entire Mine Area.
One part ("existing" mining) has a higher proportion of melaleuca and therefore mining impacts per acre in this area is less then the average per acre impact in Table D.
The other part's ("new") unit per acre is greater then Table D. Adjustments for time lag, etc., shown in Tables F4 and following.

		Within the Mine Area (Lake Belt Study Area minus Pennsuco)											
		"Pre-project" Conditon of Mine Area				Change Due to Mining						Littoral Marshes Built	
		Acres in Mine Area	Units/Acre	(see notes)	Quantity of Habitat Units	"existing" mining	Quantity of Habitat Units	"new" mining	Quantity of Habitat Units	All mining (50yr plan)	Quantity of Habitat Units	Change due to marshes	Quantity of Habitat Units
		a	b		c	d	e	f	g	h	j	k	m
		(see note)	*Table C*		*c = a * b*	*(see note)*	*e= b * d*	*(see note)*	*g = b * f*	*(see note)*	*j = e + g*	*(see note)*	*m=k = b * k*
Natural Covertypes													
P	Prairie	6,735.92	0.791		5,328.11	-81.53	-64.49	-862.84	-682.51	-944.37	-747.00		0.00
P50	Prairie w/ Mel (10-50%)	3,165.27	0.692		2,191.78	-240.35	-166.43	-1,169.10	-809.54	-1,409.45	-975.97		0.00
P75	Prairie w/ Mel (50-75%)	2,129.37	0.623		1,326.84	-131.82	-82.14	-1,077.40	-671.34	-1,209.22	-753.48		0.00
DM	Dense Melaleuca	10,143.30	0.424		4,300.42	-1,495.39	-634.00	-3,496.23	-1,482.28	-4,991.62	-2,116.28		0.00
DMS	Dense Mel Saplings	6,541.56	0.484		3,169.04	-911.42	-441.53	-2,508.04	-1,215.01	-3,419.46	-1,656.55		0.00
TI	Tree Islands	285.46	0.000	(1)	0.00	-46.63	0.00	-42.36	0.00	-88.99	0.00		0.00
WH	Willow Heads	0.00	0.000	(2)	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00
	Pond Apple	14.82	0.000	(2)	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00
Man-Altered Covers													
D	Disturbed (Forest&Open)	2,514.66	0.000	(3)	0.00	-446.32	0.00	-317.33	0.00	-763.65	0.00		0.00
DP	Disturbed Prairie	19.10	0.000	(2)	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00
DP50	Dist Pra w/Mel (10-50%)	414.39	0.346	(4)	143.47	-269.12	-93.18	0.00	0.00	-269.12	-93.18		0.00
DP75	Dist Pra w/Mel (50-75%)	216.81	0.312	(5)	67.55	-119.35	-37.18	-26.87	-8.37	-146.22	-45.56		0.00
C	Canals	347.78	0.000	(6)	0.00	-4.56	0.00	-21.11	0.00	-25.67	0.00		0.00
LP	Lake Perimeter	1,666.91	0.000	(7)	0.00	-445.29	0.00	-527.03	0.00	-972.32	0.00		0.00
WH	Other Water/Impoundmt	537.22	0.000	(8)	0.00	-135.34	0.00	-72.80	0.00	-208.14	0.00		0.00
AG	Agriculture	3,336.56	0.333	(9)	1,112.19	-828.14	-276.05	-499.38	-166.46	-1,327.52	-442.51		0.00
FPL	FPL Transmission	718.87	0.000	(6)	0.00	-5.64	0.00	-12.86	0.00	-18.50	0.00		0.00
DV	Developed	1,682.18	0.000	(1)	0.00	-56.09	0.00	-20.47	0.00	-76.56	0.00		0.00
Mining													
L	Existing Lakes	4,921.46	0.00		0.00								0.00
L	New lakes @ 640ac					5,216.99	0.00	10,653.82	0.00	15,870.81	0.00	-15,870.81	
	Lake center @ 502.8		0.00									12,468.75	
	NearShore @ 89.6 ac		0.125									2,222.50	277.81
	Littoral @ 45.7 ac		0.558									1,179.56	658.59
Acres		45,391.64				0.00		0.00		0.00		0.00	
Ecological Units					17,639.40		-1,795.00		-5,035.52		-6,830.51		936.40
						Incremental Unit per Acre change "existing" mining =	-0.34						
								Incremental Unit per Acre change "new" mining =	-0.47				
										Average Unit per Acre change for all mining (same as Table D) =	-0.43		
										Incremental % Change from "pre-project" condition =	-38.7%		
												Incremental Unit per Acre change due to construction of littoral marsh =	0.06
												Incremental % Change from "pre-project" condition =	5.3%
												Total change ecological condition due to project =	-5,894.11
												Total Unit per Acre change due to project =	-0.37
												Total % Change from "pre-project" condition =	-33.4%

Notes:

Greenbook/WRAP Approach = Chapter 5 of the "Joint State/Federal Mitigation Bank Review Team Process for Florida", October 1998.
Column "a" = EIS study area (57,515.45 acres, Table 3.10-1) minus Pennsuco (12,123.81acres, column "p")
Column "d" = Mining within footprints of previously authorized permits (from GIS analysis for FEIS).
Column "f" = Mining within area not previously authorized (from GIS analysis for FEIS).
Column "h" = FEIS Table 6.6-1. Due to round off, total mining acres shown here is 0.27 acres more then FEIS Table.
Column "k" = Constructed after mining ceases. Acres based on generic 1 mile square property.

For remaining notes, see Table D (Part 3 of 3)

Table F4 What if...no mining authorized beyond 10 year footprint (estimate based on existing/new split)?

Same as Table F2 but use the units/acre from Table F3 to reflect that a large proportion of the mining in the early years may be occurring withn poorer quality area.

Similar to Table E but splits Mine Area into two parts and uses the total acres authorized by the permit drawings (this includes the cross-hatched areas near the wellfield)

		Change due to mining								Change due to Littoral construction				Restoring Pennsuco & other areas				Balance @ Year End	
Year	Yr	Acres "existing"	increment unit/acre	Units Impact	Present Worth	Acres "new"	increment unit/acre	Units Impact	Present Worth	Acres built	increment unit/acre	Units restored	Present Worth	Restored Acres	Unit/acre change	Units restored	Present Worth	Present Worth This Year	Present Worth Cumulative
a	b	c	d	e	f	g	h	j	k	m	n	o	p	q	r	s	t	u	v
		(note 1)	*(note4)*	*(note6)*	*(note5)*	*(note 1)*	*(note4)*	*(note6)*	*(note5)*	*(note 2)*	*(note4)*	*o = m * n*	*(note5)*	*(note 3)*	*(note4)*	*s = q * r*	*(note5)*	*u=f+k+p+t*	*v=u+v'*
	0		-0.3441				-0.4726				0.5583				0.2144				
1999	1	*(note 8)*	-0.3434	*(note 8)*	0.00	0.0	-0.4708	0.00	0.00	0.0	0.5583	0.00	0.00	0.0	0.2195	0.00	0.00	0	0
2000	2	*(note 8)*	-0.3427	*(note 8)*	0.00	0.0	-0.4689	0.00	0.00	0.0	0.5583	0.00	0.00	0.0	0.2246	0.00	0.00	0	0
2001	3	*(note 8)*	-0.3420	*(note 8)*	0.00	0.0	-0.4670	0.00	0.00	0.0	0.5583	0.00	0.00	0.0	0.2297	0.00	0.00	0	0
2002	4	266.0	-0.3414	-98.10	-87.16	65.5	-0.4652	-32.91	-29.24	0.0	0.5583	0.00	0.00	163.8	0.2348	38.44	34.16	-82	-82
2003	5	261.0	-0.3407	-96.06	-82.86	70.5	-0.4633	-35.28	-30.44	0.0	0.5583	0.00	0.00	176.3	0.2398	42.27	36.47	-77	-159
2004	6	256.0	-0.3400	-94.03	-78.75	75.5	-0.4614	-37.63	-31.52	0.0	0.5583	0.00	0.00	188.8	0.2449	46.23	38.72	-72	-231
2005	7	226.0	-0.3393	-82.85	-67.37	105.5	-0.4595	-52.38	-42.59	0.0	0.5583	0.00	0.00	263.8	0.2500	65.94	53.62	-56	-287
2006	8	226.0	-0.3387	-82.69	-65.27	105.5	-0.4577	-52.16	-41.18	0.0	0.5583	0.00	0.00	263.8	0.2551	67.29	53.12	-53	-340
2007	9	226.0	-0.3380	-82.52	-63.25	105.5	-0.4558	-51.95	-39.81	0.0	0.5583	0.00	0.00	263.8	0.2602	68.63	52.60	-50	-391
2008	10	226.0	-0.3373	-82.36	-61.28	105.5	-0.4539	-51.74	-38.50	0.0	0.5583	0.00	0.00	263.8	0.2653	69.97	52.06	-48	-438
2009	11	226.0	-0.3367	-82.19	-59.38	105.5	-0.4521	-51.52	-37.22	0.0	0.5583	0.00	0.00	263.8	0.2704	71.31	51.52	-45	-484
2010	12	215.0	-0.3360	-78.04	-54.73	116.5	-0.4502	-56.66	-39.74	0.0	0.5583	0.00	0.00	291.3	0.2755	80.23	56.27	-38	-522
2011	13	207.0	-0.3353	-74.98	-51.06	124.5	-0.4483	-60.30	-41.06	0.0	0.5583	0.00	0.00	311.3	0.2806	87.32	59.46	-33	-554
2012	14	181.0	-0.3346	-65.43	-43.26	149.5	-0.4465	-72.10	-47.67	0.0	0.5583	0.00	0.00	373.8	0.2856	106.76	70.58	-20	-575
2013	15	129.0	-0.3340	-46.54	-29.87	201.5	-0.4446	-96.78	-62.12	0.0	0.5583	0.00	0.00	503.8	0.2907	146.46	94.00	2	-573
2014	16	129.0	-0.3333	-46.45	-28.94	201.5	-0.4427	-96.37	-60.05	0.0	0.5583	0.00	0.00	503.8	0.2958	149.02	92.86	4	-569
2015	17	20.6	-0.3326	-7.41	-4.48	36.7	-0.4408	-17.46	-10.56	0.0	0.5583	0.00	0.00	91.6	0.3009	27.57	16.68	2	-567
2016	18	0.0	-0.3319	0.00	0.00	0.0	-0.4390	0.00	0.00	350.4	0.5583	195.62	114.91	2516.6	0.3060	770.06	452.33	567	0
	50		-0.3104				-0.3791				0.5583				0.4688				
Sum Acres		2,794.62				1,569.16				350.37				6,439.44					
Sum Units				-1,019.64				-765.24				195.62				1,837.51			
Sum Present Worth					-777.66				-551.69				114.91				1,214.45		

Notes:

(1) Estimated pace of mining based on projections in Table A. Year 2015 is the partial amount so total equals the "10 year plan" footprint.

(2) Presumtion is if expansion of the mining footprint is not authorized, then littoral marshes created in year after last of the mining.

(3) Estimated pace of Pennsuco and other lands based on projections in Table A, except Year 2015 is a partial amount.
Presumption is if expansion not authorized, then in Year 2016 lands in Pennsuco acquired so that Present Worth Ratio = 1:1

(4) Unit/Acre values shown at Year 0 are the "incremental unit/acre" figures of Table D.
Using Table D (50yr) units/acre instead of Table F1 since the unit/acre difference is so small.
Values at Year 50 from a recalculated Table D with dense melaleuca covering entire area.
Values for other years based on assumption melalecua will cover entire area linearly in 50 years.
Note that FEIS Section 3.10.2 reports expansion is exponential about 20 years.

(5) Present Worth of Units in Year x = Units/(1.03)^year = Temporal Lags between time impacts occur and restoration/creation provided. For calcuation ease, convert all to Present Worth at Year 0.

(6) Deep-cut acres in Table A increased to encompass acres cleared for littoral/work areas.

(7) Impacts prior to issuance of new permits in 2002 not included since done under previous permits.

Projected Mitigation Ratios	
Acres Restored : Acres Mined =	1.48
Units Restored : Units lost from mining =	1.14
Present Worth Units Restored : PW Units Mining =	1.00

Table F5 What if…permits expire at 10 years and not renewed (estimate based on existing/new split)?

Uses the units/acre from Table F3 to reflect that a large proportion of the mining in the early years may be occurring in poorer quality area.

Same as Table F4 but using the acres that are projected to be mined in 10 years (this includes the cross-hatched areas near the wellfield)

		Change due to mining								Change due to Littoral construction				Restoring Pennsuco & other areas				Balance @ Year End	
Year	Yr	Acres "existing"	increment unit/acre	Units Impact	Present Worth	Acres "new"	increment unit/acre	Units Impact	Present Worth	Acres built	increment unit/acre	Units restored	Present Worth	Restored Acres	Unit/acre change	Units restored	Present Worth	Present Worth This Year	Present Worth Cumulative
a	b	c	d	e	f	g	h	j	k	m	n	o	p	q	r	s	t	u	v
		(note 1)	*(note4)*	*(note6)*	*(note5)*	*(note 1)*	*(note4)*	*(note6)*	*(note5)*	*(note 2)*	*(note4)*	*o = m * n*	*(note5)*	*(note 3)*	*(note4)*	*s = q * r*	*(note5)*	*u=f+k+p+t*	*v=u+v'*
	0		-0.3441				-0.4726				0.5583				0.2144				
1999	1	*(note 8)*	-0.3434	*(note 8)*	0.00	0.0	-0.4708	0.00	0.00	0.0	0.5583	0.00	0.00	0.0	0.2195	0.00	0.00	0	0
2000	2	*(note 8)*	-0.3427	*(note 8)*	0.00	0.0	-0.4689	0.00	0.00	0.0	0.5583	0.00	0.00	0.0	0.2246	0.00	0.00	0	0
2001	3	*(note 8)*	-0.3420	*(note 8)*	0.00	0.0	-0.4670	0.00	0.00	0.0	0.5583	0.00	0.00	0.0	0.2297	0.00	0.00	0	0
2002	4	266.0	-0.3414	-98.10	-87.16	65.5	-0.4652	-32.91	-29.24	0.0	0.5583	0.00	0.00	163.8	0.2348	38.44	34.16	-82	-82
2003	5	261.0	-0.3407	-96.06	-82.86	70.5	-0.4633	-35.28	-30.44	0.0	0.5583	0.00	0.00	176.3	0.2398	42.27	36.47	-77	-159
2004	6	256.0	-0.3400	-94.03	-78.75	75.5	-0.4614	-37.63	-31.52	0.0	0.5583	0.00	0.00	188.8	0.2449	46.23	38.72	-72	-231
2005	7	226.0	-0.3393	-82.85	-67.37	105.5	-0.4595	-52.38	-42.59	0.0	0.5583	0.00	0.00	263.8	0.2500	65.94	53.62	-56	-287
2006	8	226.0	-0.3387	-82.69	-65.27	105.5	-0.4577	-52.16	-41.18	0.0	0.5583	0.00	0.00	263.8	0.2551	67.29	53.12	-53	-340
2007	9	226.0	-0.3380	-82.52	-63.25	105.5	-0.4558	-51.95	-39.81	0.0	0.5583	0.00	0.00	263.8	0.2602	68.63	52.60	-50	-391
2008	10	226.0	-0.3373	-82.36	-61.28	105.5	-0.4539	-51.74	-38.50	0.0	0.5583	0.00	0.00	263.8	0.2653	69.97	52.06	-48	-438
2009	11	226.0	-0.3367	-82.19	-59.38	105.5	-0.4521	-51.52	-37.22	0.0	0.5583	0.00	0.00	263.8	0.2704	71.31	51.52	-45	-484
2010	12	215.0	-0.3360	-78.04	-54.73	116.5	-0.4502	-56.66	-39.74	0.0	0.5583	0.00	0.00	291.3	0.2755	80.23	56.27	-38	-522
2011	13	207.0	-0.3353	-74.98	-51.06	124.5	-0.4483	-60.30	-41.06	0.0	0.5583	0.00	0.00	311.3	0.2806	87.32	59.46	-33	-554
2012	14	0.0	-0.3346	0.00	0.00	0.0	-0.4465	0.00	0.00	266.2	0.5583	148.61	98.25	2415.6	0.2856	689.99	456.16	554	0
2013	15	0.0	-0.3340	0.00	0.00	0.0	-0.4446	0.00	0.00	0.0	0.5583	0.00	0.00	0.0	0.2907	0.00	0.00	0	0
2014	16	0.0	-0.3333	0.00	0.00	0.0	-0.4427	0.00	0.00	0.0	0.5583	0.00	0.00	0.0	0.2958	0.00	0.00	0	0
2015	17	0.0	-0.3326	0.00	0.00	0.0	-0.4408	0.00	0.00	0.0	0.5583	0.00	0.00	0.0	0.3009	0.00	0.00	0	0
2016	18	0.0	-0.3319	0.00	0.00	0.0	-0.4390	0.00	0.00	0.0	0.5583	0.00	0.00	0.0	0.3060	0.00	0.00	0	0
	50		-0.3104				-0.3791				0.5583				0.4688				
Sum Acres		2,335.00				980.00				266.16				4,865.56					
Sum Units				-853.81				-482.53				148.61				1,327.63			
Sum Present Worth					-671.11				-371.29				98.25				944.15		

Notes:

(1) Estimated pace of mining based on projections in Table A.

(2) Presumtion is if expansion of the mining footprint is not authorized, then littoral marshes created in year after last of the mining.

(3) Estimated pace of Pennsuco and other lands based on projections in Table A, except Year 2015 is a partial amount.
Presumption is if permits not renewed, then in Year 2012 lands in Pennsuco acquired so that Present Worth Ratio = 1:1

(4) Unit/Acre values shown at Year 0 are the "incremental unit/acre" figures of Table D.
Using Table D (50yr) units/acre instead of Table F1 since the unit/acre difference is so small.
Values at Year 50 from a recalculated Table D with dense melaleuca covering entire area.
Values for other years based on assumption melalecua will cover entire area linearly in 50 years.
Note that FEIS Section 3.10.2 reports expansion is exponential about 20 years.

(5) Present Worth of Units in Year x = Units/(1.03)^year = Temporal Lags between time impacts occur and restoration/creation provided. For calcuation ease, convert all to Present Worth at Year 0.

(6) Deep-cut acres in Table A increased to encompass acres cleared for littoral/work areas.

(7) Impacts prior to issuance of new permits in 2002 not included since done under previous permits.

Projected Mitigation Ratios	
Acres Restored : Acres Mined =	1.47
Units Restored : Units lost from mining =	1.10
Present Worth Units Restored : PW Units Mining =	1.00

Table F6 What if…melaleuca has spread between year 1992 and 1998?

Uses the units/acre from Table F3 to reflect that a large proportion of the mining in the early years may be occurring in poorer quality area.
Same as Table F5 but the incremental unit/acre in Year 0 (1998) will be reset to the value shown on Table F5 for the Year 2004 (6 year shift)

		Change due to mining								Change due to Littoral construction				Restoring Pennsuco & other areas				Balance @ Year End	
Year	Yr	Acres	increment	Units	Present	Acres	increment	Units	Present	Acres	increment	Units	Present	Restored	Unit/acre	Units	Present	Present Worth	
		"existing"	unit/acre	Impact	Worth	"new"	unit/acre	Impact	Worth	built	unit/acre	restored	Worth	Acres	change	restored	Worth	This Year	Cumulative
a	b	c	d	e	f	g	h	j	k	m	n	o	p	q	r	s	t	u	v
		(note 1)	*(note4)*	*(note6)*	*(note5)*	*(note 1)*	*(note4)*	*(note6)*	*(note5)*	*(note 2)*	*(note4)*	*o = m * n*	*(note5)*	*(note 3)*	*(note4)*	*s = q * r*	*(note5)*	*u=f+k+p+t*	*v=u+v'*
	0		-0.3400				-0.4614				0.5583				0.2449				
1999	1	*(note 8)*	-0.3394	*(note 8)*	0.00	0.0	-0.4598	0.00	0.00	0.0	0.5583	0.00	0.00	0.0	0.2494	0.00	0.00	0	0
2000	2	*(note 8)*	-0.3388	*(note 8)*	0.00	0.0	-0.4581	0.00	0.00	0.0	0.5583	0.00	0.00	0.0	0.2539	0.00	0.00	0	0
2001	3	*(note 8)*	-0.3382	*(note 8)*	0.00	0.0	-0.4565	0.00	0.00	0.0	0.5583	0.00	0.00	0.0	0.2584	0.00	0.00	0	0
2002	4	266.0	-0.3377	-97.03	-86.21	65.5	-0.4548	-32.18	-28.59	0.0	0.5583	0.00	0.00	163.8	0.2628	43.04	38.24	-77	-77
2003	5	261.0	-0.3371	-95.04	-81.98	70.5	-0.4532	-34.51	-29.77	0.0	0.5583	0.00	0.00	176.3	0.2673	47.12	40.64	-71	-148
2004	6	256.0	-0.3365	-93.05	-77.93	75.5	-0.4515	-36.83	-30.84	0.0	0.5583	0.00	0.00	188.8	0.2718	51.30	42.97	-66	-213
2005	7	226.0	-0.3359	-82.00	-66.67	105.5	-0.4499	-51.27	-41.69	0.0	0.5583	0.00	0.00	263.8	0.2763	72.87	59.25	-49	-263
2006	8	226.0	-0.3353	-81.86	-64.62	105.5	-0.4482	-51.09	-40.33	0.0	0.5583	0.00	0.00	263.8	0.2808	74.05	58.46	-46	-309
2007	9	226.0	-0.3347	-81.71	-62.63	105.5	-0.4466	-50.90	-39.01	0.0	0.5583	0.00	0.00	263.8	0.2852	75.23	57.66	-44	-353
2008	10	226.0	-0.3341	-81.57	-60.69	105.5	-0.4450	-50.71	-37.73	0.0	0.5583	0.00	0.00	263.8	0.2897	76.41	56.86	-42	-395
2009	11	226.0	-0.3335	-81.42	-58.82	105.5	-0.4433	-50.52	-36.50	0.0	0.5583	0.00	0.00	263.8	0.2942	77.59	56.05	-39	-434
2010	12	215.0	-0.3329	-77.32	-54.23	116.5	-0.4417	-55.58	-38.99	0.0	0.5583	0.00	0.00	291.3	0.2987	86.99	61.01	-32	-466
2011	13	207.0	-0.3323	-74.31	-50.60	124.5	-0.4400	-59.18	-40.30	0.0	0.5583	0.00	0.00	311.3	0.3031	94.35	64.25	-27	-493
2012	14	0.0	-0.3317	0.00	0.00	0.0	-0.4384	0.00	0.00	266.2	0.5583	148.61	98.25	1939.8	0.3076	596.72	394.50	493	0
2013	15	0.0	-0.3311	0.00	0.00	0.0	-0.4367	0.00	0.00	0.0	0.5583	0.00	0.00	0.0	0.3121	0.00	0.00	0	0
2014	16	0.0	-0.3305	0.00	0.00	0.0	-0.4351	0.00	0.00	0.0	0.5583	0.00	0.00	0.0	0.3166	0.00	0.00	0	0
2015	17	0.0	-0.3299	0.00	0.00	0.0	-0.4334	0.00	0.00	0.0	0.5583	0.00	0.00	0.0	0.3211	0.00	0.00	0	0
2016	18	0.0	-0.3293	0.00	0.00	0.0	-0.4318	0.00	0.00	0.0	0.5583	0.00	0.00	0.0	0.3255	0.00	0.00	0	0
	50		-0.3104				-0.3791				0.5583				0.4688				
Sum Acres		2,335.00				980.00				266.16				4,389.78					
Sum Units				-845.30				-472.79				148.61				1,295.68			
Sum Present Worth					-664.38				-363.76				98.25				929.89		

Notes:

(1) Estimated pace of mining based on projections in Table A.
(2) Presumtion is if expansion of the mining footprint is not authorized, then littoral marshes created in year after last of the mining.
(3) Estimated pace of Pennsuco and other lands based on projections in Table A, except Year 2015 is a partial amount.
Presumption is if permits not renewed, then in Year 2012 lands in Pennsuco acquired so that Present Worth Ratio = 1:1
(4) Unit/Acre values shown at Year 0 are the "incremental unit/acre" figures of Table D.
Using Table D (50yr) units/acre instead of Table F1 since the unit/acre difference is so small.
Values at Year 50 from a recalculated Table D with dense melaleuca covering entire area.
Values for other years based on assumption melalecua will cover entire area linearly in 50 years.
Note that FEIS Section 3.10.2 reports expansion is exponential about 20 years.
(5) Present Worth of Units in Year x = Units/(1.03)^year = Temporal Lags between time impacts occur and restoration/creation provided. For calcuation ease, convert all to Present Worth at Year 0.
(6) Deep-cut acres in Table A increased to encompass acres cleared for littoral/work areas.
(7) Impacts prior to issuance of new permits in 2002 not included since done under previous permits.

Projected Mitigation Ratios	
Acres Restored : Acres Mined =	1.32
Units Restored : Units lost from mining =	1.10
Present Worth Units Restored : PW Units Mining =	1.00

Table F7 What if…spend all of income $ received each year on acquisition/restoration?

Uses the units/acre from Table F3 to reflect that a large proportion of the mining in the early years may be occurring in poorer quality area.

Same as Table F6 but the entire Fee $ income each year is spent same year instead of spending just a part and holding rest to earn interest to buy/restore land later.

		Change due to mining								Change due to Littoral construction				Restoring Pennsuco & other areas				Balance @ Year End Present Worth	
Year	Yr	Acres "existing"	increment unit/acre	Units Impact	Present Worth	Acres "new"	increment unit/acre	Units Impact	Present Worth	Acres built	increment unit/acre	Units restored	Present Worth	Restored Acres	Unit/acre change	Units restored	Present Worth	This Year	Cumulative
a	b	c	d	e	f	g	h	j	k	m	n	o	p	q	r	s	t	u	v
		(note 1)	*(note4)*	*(note6)*	*(note5)*	*(note 1)*	*(note4)*	*(note6)*	*(note5)*	*(note 2)*	*(note4)*	*o = m * n*	*(note5)*	*(note 3)*	*(note4)*	*s = q * r*	*(note5)*	*u=f+k+p+t*	*v=u+v'*
	0		-0.3400				-0.4614				0.5583				0.2449				
1999	1	*(note 8)*	-0.3394	*(note 8)*	0.00	0.0	-0.4598	0.00	0.00	0.0	0.5583	0.00	0.00	0.0	0.2494	0.00	0.00	0	0
2000	2	*(note 8)*	-0.3388	*(note 8)*	0.00	0.0	-0.4581	0.00	0.00	0.0	0.5583	0.00	0.00	0.0	0.2539	0.00	0.00	0	0
2001	3	*(note 8)*	-0.3382	*(note 8)*	0.00	0.0	-0.4565	0.00	0.00	0.0	0.5583	0.00	0.00	0.0	0.2584	0.00	0.00	0	0
2002	4	266.0	-0.3377	-97.03	-86.21	65.5	-0.4548	-32.18	-28.59	0.0	0.5583	0.00	0.00	1060.4	0.2628	278.72	247.64	133	133
2003	5	261.0	-0.3371	-95.04	-81.98	70.5	-0.4532	-34.51	-29.77	0.0	0.5583	0.00	0.00	358.3	0.2673	95.79	82.63	-29	104
2004	6	256.0	-0.3365	-93.05	-77.93	75.5	-0.4515	-36.83	-30.84	0.0	0.5583	0.00	0.00	365.6	0.2718	99.38	83.23	-26	78
2005	7	226.0	-0.3359	-82.00	-66.67	105.5	-0.4499	-51.27	-41.69	0.0	0.5583	0.00	0.00	373.1	0.2763	103.07	83.81	-25	54
2006	8	226.0	-0.3353	-81.86	-64.62	105.5	-0.4482	-51.09	-40.33	0.0	0.5583	0.00	0.00	380.7	0.2808	106.88	84.37	-21	33
2007	9	226.0	-0.3347	-81.71	-62.63	105.5	-0.4466	-50.90	-39.01	0.0	0.5583	0.00	0.00	388.4	0.2852	110.79	84.91	-17	16
2008	10	226.0	-0.3341	-81.57	-60.69	105.5	-0.4450	-50.71	-37.73	0.0	0.5583	0.00	0.00	396.3	0.2897	114.82	85.44	-13	3
2009	11	226.0	-0.3335	-81.42	-58.82	105.5	-0.4433	-50.52	-36.50	0.0	0.5583	0.00	0.00	404.4	0.2942	118.97	85.94	-9	-6
2010	12	215.0	-0.3329	-77.32	-54.23	116.5	-0.4417	-55.58	-38.99	0.0	0.5583	0.00	0.00	412.6	0.2987	123.23	86.43	-7	-13
2011	13	207.0	-0.3323	-74.31	-50.60	124.5	-0.4400	-59.18	-40.30	0.0	0.5583	0.00	0.00	421.0	0.3031	127.63	86.91	-4	-17
2012	14	0.0	-0.3317	0.00	0.00	0.0	-0.4384	0.00	0.00	266.2	0.5583	148.61	98.25	0.0	0.3076	0.00	0.00	98	81
2013	15	0.0	-0.3311	0.00	0.00	0.0	-0.4367	0.00	0.00	0.0	0.5583	0.00	0.00	0.0	0.3121	0.00	0.00	0	81
2014	16	0.0	-0.3305	0.00	0.00	0.0	-0.4351	0.00	0.00	0.0	0.5583	0.00	0.00	0.0	0.3166	0.00	0.00	0	81
2015	17	0.0	-0.3299	0.00	0.00	0.0	-0.4334	0.00	0.00	0.0	0.5583	0.00	0.00	0.0	0.3211	0.00	0.00	0	81
2016	18	0.0	-0.3293	0.00	0.00	0.0	-0.4318	0.00	0.00	0.0	0.5583	0.00	0.00	0.0	0.3255	0.00	0.00	0	81
	50		-0.3104				-0.3791				0.5583				0.4688				
Sum Acres		2,335.00				980.00				266.16				4,560.83					
Sum Units				-845.30				-472.79				148.61				1,279.28			
Sum Present Worth					-664.38				-363.76				98.25				1,011.31		

Notes:

(1) Estimated pace of mining based on projections in Table A.

(2) Presumtion is if expansion of the mining footprint is not authorized, then littoral marshes created in year after last of the mining.

(3) Acres of acquisiton and restoration = Total Fee Expected (column "g" Table A) divided by Cost to Restore 1 acre (column "m" Table A)
For Year 2002, includes $4,638,997 balance in trust fund as of January 1, 2002
Presumption is if permits not renewed, then in Year 2012 lands in Pennsuco acquired so that Present Worth Ratio = 1:1

(4) Unit/Acre values shown at Year 0 are the "incremental unit/acre" figures of Table D.
Using Table D (50yr) units/acre instead of Table F1 since the unit/acre difference is so small.
Values at Year 50 from a recalculated Table D with dense melaleuca covering entire area.
Values for other years based on assumption melalecua will cover entire area linearly in 50 years.
Note that FEIS Section 3.10.2 reports expansion is exponential about 20 years.

(5) Present Worth of Units in Year x = Units/(1.03)^year = Temporal Lags between time impacts occur and restoration/creation provided. For calcuation ease, convert all to Present Worth at Year 0.

(6) Deep-cut acres in Table A increased to encompass acres cleared for littoral/work areas.

(7) Impacts prior to issuance of new permits in 2002 not included since done under previous permits.

Projected Mitigation Ratios	
Acres Restored : Acres Mined =	1.38
Units Restored : Units lost from mining =	1.08
Present Worth Units Restored : PW Units Mining =	1.08

Table F8 (Part 1 of 2) What if…for all 50 years all of income $ received each year is spent on acquisition/restoration?

Same as Table F7 except showing entire 50 years.

		Change due to mining								Change due to Littoral construction				Restoring Pennsuco & other areas				Balance @ Year End Present Worth	
Year	Yr	Acres "existing"	increment unit/acre	Units Impact	Present Worth	Acres "new"	increment unit/acre	Units Impact	Present Worth	Acres built	increment unit/acre	Units restored	Present Worth	Restored Acres	Unit/acre change	Units restored	Present Worth	This Year	Cumulative
a	b	c	d	e	f	g	h	j	k	m	n	o	p	q	r	s	t	u	v
		(note 1)	*(note4)*	*(note6)*	*(note5)*	*(note 1)*	*(note4)*	*(note6)*	*(note5)*	*(note 2)*	*(note4)*	*o = m * n*	*(note5)*	*(note 3)*	*(note4)*	*s = q * r*	*(note5)*	*u=f+k+p+t*	*v=u+v'*
	0		-0.3400				-0.4614				0.5583				0.2449				
1999	1	*(note 8)*	-0.3394	*(note 8)*	0.00	0.0	-0.4598	0.00	0.00	0.0	0.5583	0.00	0.00	0.0	0.2494	0.00	0.00	0	0
2000	2	*(note 8)*	-0.3388	*(note 8)*	0.00	0.0	-0.4581	0.00	0.00	0.0	0.5583	0.00	0.00	0.0	0.2539	0.00	0.00	0	0
2001	3	*(note 8)*	-0.3382	*(note 8)*	0.00	0.0	-0.4565	0.00	0.00	0.0	0.5583	0.00	0.00	0.0	0.2584	0.00	0.00	0	0
2002	4	266.0	-0.3377	-97.03	-86.21	65.5	-0.4548	-32.18	-28.59	0.0	0.5583	0.00	0.00	1060.4	0.2628	278.72	247.64	133	133
2003	5	261.0	-0.3371	-95.04	-81.98	70.5	-0.4532	-34.51	-29.77	0.0	0.5583	0.00	0.00	358.3	0.2673	95.79	82.63	-29	104
2004	6	256.0	-0.3365	-93.05	-77.93	75.5	-0.4515	-36.83	-30.84	0.0	0.5583	0.00	0.00	365.6	0.2718	99.38	83.23	-26	78
2005	7	226.0	-0.3359	-82.00	-66.67	105.5	-0.4499	-51.27	-41.69	0.0	0.5583	0.00	0.00	373.1	0.2763	103.07	83.81	-25	54
2006	8	226.0	-0.3353	-81.86	-64.62	105.5	-0.4482	-51.09	-40.33	0.0	0.5583	0.00	0.00	380.7	0.2808	106.88	84.37	-21	33
2007	9	226.0	-0.3347	-81.71	-62.63	105.5	-0.4466	-50.90	-39.01	0.0	0.5583	0.00	0.00	388.4	0.2852	110.79	84.91	-17	16
2008	10	226.0	-0.3341	-81.57	-60.69	105.5	-0.4450	-50.71	-37.73	0.0	0.5583	0.00	0.00	396.3	0.2897	114.82	85.44	-13	3
2009	11	226.0	-0.3335	-81.42	-58.82	105.5	-0.4433	-50.52	-36.50	0.0	0.5583	0.00	0.00	404.4	0.2942	118.97	85.94	-9	-6
2010	12	215.0	-0.3329	-77.32	-54.23	116.5	-0.4417	-55.58	-38.99	0.0	0.5583	0.00	0.00	412.6	0.2987	123.23	86.43	-7	-13
2011	13	207.0	-0.3323	-74.31	-50.60	124.5	-0.4400	-59.18	-40.30	0.0	0.5583	0.00	0.00	421.0	0.3031	127.63	86.91	-4	-17
2012	14	181.0	-0.3317	-64.86	-42.88	149.5	-0.4384	-70.80	-46.81	0.0	0.5583	0.00	0.00	428.3	0.3076	131.75	87.10	-3	-19
2013	15	129.0	-0.3311	-46.14	-29.62	201.5	-0.4367	-95.06	-61.02	0.0	0.5583	0.00	0.00	437.0	0.3121	136.39	87.54	-3	-23
2014	16	129.0	-0.3305	-46.06	-28.70	201.5	-0.4351	-94.71	-59.02	0.0	0.5583	0.00	0.00	445.9	0.3166	141.16	87.97	0	-22
2015	17	119.0	-0.3299	-42.42	-25.66	211.5	-0.4334	-99.03	-59.91	0.0	0.5583	0.00	0.00	455.0	0.3211	146.07	88.37	3	-19
2016	18	75.0	-0.3293	-26.68	-15.67	255.5	-0.4318	-119.18	-70.00	0.0	0.5583	0.00	0.00	464.2	0.3255	151.12	88.77	3	-16
2017	19	105.0	-0.3288	-37.29	-21.27	225.5	-0.4301	-104.78	-59.76	0.0	0.5583	0.00	0.00	473.7	0.3300	156.31	89.14	8	-8
2018	20	110.0	-0.3282	-39.00	-21.59	220.5	-0.4285	-102.07	-56.51	0.0	0.5583	0.00	0.00	483.3	0.3345	161.66	89.51	11	3
2019	21	115.0	-0.3276	-40.69	-21.88	215.5	-0.4268	-99.37	-53.42	0.0	0.5583	0.00	0.00	493.1	0.3390	167.16	89.86	15	18
2020	22	125.0	-0.3270	-44.15	-23.04	205.5	-0.4252	-94.39	-49.26	0.0	0.5583	0.00	0.00	503.2	0.3434	172.81	90.19	18	36
2021	23	125.0	-0.3264	-44.07	-22.33	205.5	-0.4235	-94.03	-47.64	0.0	0.5583	0.00	0.00	513.4	0.3479	178.63	90.51	21	56
2022	24	115.0	-0.3258	-40.47	-19.91	215.5	-0.4219	-98.22	-48.32	0.0	0.5583	0.00	0.00	523.9	0.3524	184.61	90.81	23	79
2023	25	107.0	-0.3252	-37.59	-17.95	223.5	-0.4203	-101.47	-48.46	0.0	0.5583	0.00	0.00	534.5	0.3569	190.76	91.11	25	103
2024	26	75.0	-0.3246	-26.30	-12.20	255.5	-0.4186	-115.54	-53.58	0.0	0.5583	0.00	0.00	545.4	0.3614	197.08	91.39	26	129
2025	27	16.5	-0.3240	-5.78	-2.60	258.5	-0.4170	-116.44	-52.42	0.0	0.5583	0.00	0.00	463.0	0.3658	169.40	76.26	21	150
2026	28	32.0	-0.3234	-11.18	-4.89	263.5	-0.4153	-118.22	-51.67	0.0	0.5583	0.00	0.00	507.7	0.3703	188.00	82.17	26	176
2027	29	8.7	-0.3228	-3.03	-1.29	317.5	-0.4137	-141.88	-60.21	0.0	0.5583	0.00	0.00	571.8	0.3748	214.32	90.94	29	205
2028	30	0.0	-0.3222	0.00	0.00	308.5	-0.4120	-137.31	-56.57	0.0	0.5583	0.00	0.00	551.8	0.3793	209.28	86.22	30	235
2029	31	0.0	-0.3216	0.00	0.00	252.5	-0.4104	-111.94	-44.77	0.0	0.5583	0.00	0.00	460.8	0.3837	176.84	70.73	26	261
2030	32	0.0	-0.3210	0.00	0.00	247.5	-0.4087	-109.28	-42.44	0.0	0.5583	0.00	0.00	460.9	0.3882	178.93	69.49	27	288

Table continues on next page

Table F8 (Part 2 of 2) What if…for all 50 years all of income $ received each year is spent on acquisition/restoration?

Table continued from previous page

		Change due to mining								Change due to Littoral construction				Restoring Pennsuco & other areas				Balance @ Year End Present Worth	
Year	Yr	Acres "existing"	increment unit/acre	Units Impact	Present Worth	Acres "new"	increment unit/acre	Units Impact	Present Worth	Acres built	increment unit/acre	Units restored	Present Worth	Restored Acres	Unit/acre change	Units restored	Present Worth	This Year	Cumulative
a	b	c	d	e	f	g	h	j	k	m	n	o	p	q	r	s	t	u	v
		(note 1)	*(note4)*	*(note6)*	*(note5)*	*(note 1)*	*(note4)*	*(note6)*	*(note5)*	*(note 2)*	*(note4)*	*o = m * n*	*(note5)*	*(note 3)*	*(note4)*	*s = q * r*	*(note5)*	*u=f+k+p+t*	*v=u+v'*
2031	33	0.0	-0.3204	0.00	0.00	247.5	-0.4071	-108.84	-41.04	0.0	0.5583	0.00	0.00	470.3	0.3927	184.68	69.63	29	317
2032	34	0.0	-0.3199	0.00	0.00	252.5	-0.4054	-110.59	-40.48	0.0	0.5583	0.00	0.00	489.5	0.3972	194.43	71.17	31	347
2033	35	0.0	-0.3193	0.00	0.00	252.5	-0.4038	-110.14	-39.14	0.0	0.5583	0.00	0.00	499.5	0.4017	200.63	71.30	32	379
2034	36	0.0	-0.3187	0.00	0.00	252.5	-0.4021	-109.69	-37.85	0.0	0.5583	0.00	0.00	509.7	0.4061	206.99	71.42	34	413
2035	37	0.0	-0.3181	0.00	0.00	247.5	-0.4005	-107.08	-35.87	0.0	0.5583	0.00	0.00	509.7	0.4106	209.30	70.11	34	447
2036	38	0.0	-0.3175	0.00	0.00	237.5	-0.3988	-102.33	-33.28	0.0	0.5583	0.00	0.00	499.1	0.4151	207.17	67.38	34	481
2037	39	0.0	-0.3169	0.00	0.00	233.0	-0.3972	-99.98	-31.57	0.0	0.5583	0.00	0.00	499.6	0.4196	209.62	66.19	35	516
2038	40	0.0	-0.3163	0.00	0.00	231.0	-0.3956	-98.71	-30.26	0.0	0.5583	0.00	0.00	505.4	0.4240	214.31	65.70	35	551
2039	41	0.0	-0.3157	0.00	0.00	235.5	-0.3939	-100.21	-29.83	0.0	0.5583	0.00	0.00	525.7	0.4285	225.28	67.05	37	589
2040	42	0.0	-0.3151	0.00	0.00	235.5	-0.3923	-99.79	-28.84	0.0	0.5583	0.00	0.00	536.4	0.4330	232.27	67.12	38	627
2041	43	0.0	-0.3145	0.00	0.00	235.5	-0.3906	-99.37	-27.88	0.0	0.5583	0.00	0.00	547.3	0.4375	239.45	67.18	39	666
2042	44	0.0	-0.3139	0.00	0.00	235.5	-0.3890	-98.96	-26.95	0.0	0.5583	0.00	0.00	558.5	0.4420	246.82	67.23	40	706
2043	45	0.0	-0.3133	0.00	0.00	235.5	-0.3873	-98.54	-26.06	0.0	0.5583	0.00	0.00	569.8	0.4464	254.40	67.27	41	748
2044	46	0.0	-0.3127	0.00	0.00	235.5	-0.3857	-98.12	-25.19	0.0	0.5583	0.00	0.00	581.4	0.4509	262.18	67.31	42	790
2045	47	0.0	-0.3121	0.00	0.00	235.5	-0.3840	-97.70	-24.35	0.0	0.5583	0.00	0.00	593.3	0.4554	270.17	67.34	43	833
2046	48	0.0	-0.3116	0.00	0.00	228.5	-0.3824	-94.39	-22.84	0.0	0.5583	0.00	0.00	587.3	0.4599	270.10	65.36	43	875
2047	49	0.0	-0.3110	0.00	0.00	124.8	-0.3807	-51.33	-12.06	0.0	0.5583	0.00	0.00	327.3	0.4643	151.99	35.71	24	899
	50		-0.3104				-0.3791				0.5583				0.4688				
Sum Acres		3,902.20				9,370.30				0.00				22,687.71					
Sum Units				-1,401.03				-4,182.29				0.00				8,311.33			
Sum Present Worth					-975.86				-1,899.03				0.00				3,773.85		

Notes:

(1) Estimated pace of mining based on projections in Table A.

(2) Pace of littoral area creation difficult to project due to unknowns so not included at this time.

(3) Acres of acquisiton and restoration = Total Fee Expected (column "g" Table A) divided by Cost to Restore 1 acre (column "m" Table A)
For Year 2002, includes $4,638,997 balance in trust fund as of January 1, 2002
Presumption is additional lands outside Pennsuco will be acquired & restored.

(4) Unit/Acre values shown at Year 0 are the "incremental unit/acre" figures of Table D.
Values at Year 50 from a recalculated Table D with dense melaleuca covering entire area.
Values for other years based on assumption melalecua will cover entire area linearly in 50 years.
Note that FEIS Section 3.10.2 reports expansion is exponential about 20 years.

(5) Present Worth of Units in Year x = Units/(1.03)^year = Temporal Lags between time impacts occur and restoration/creation provided. For calcuation ease, convert all to Present Worth at Year 0.

(6) Deep-cut acres in Table A increased to encompass acres cleared for littoral/work areas.

(7) Impacts prior to issuance of new permits in 2002 not included since done under previous permits.

Projected Mitigation Ratios	
Acres Restored : Acres Mined =	1.71
Units Restored : Units lost from mining =	1.49
Present Worth Units Restored : PW Units Mining =	1.31

Table F9 What if…the Fee Plan (Table A) was revised to spend $ as received?

Relates to Tables F7 and F8.

Year	Yr	Mining Existing Permits	Mining New Permits	Total Mining Area	Tons of material	Fee $/ton	Total Fee expected this year	Mining New Permits	Mitigation Acres ~~Owed~~	Cost to Restore $/Acre	Total Spend on Mitigation this year
	a	b	c	d	e	f	g	h	k	m	n
		(note 2)	*(note 2)*	*d = b+c*	*(note 3)*	*(note 4)*	*g = e * f*	*h = c*	*k = g / m*	*(note 5)*	*n = k * m*
1999	1	78.1	0.0	78.1	9,756,250	0.05000	*(note 7)*	0.0	0.0	6,142	0
2000	2	312.0	0.0	312.0	39,000,000	0.05000	*(note 7)*	0.0	0.0	6,142	0
2001	3	331.5	0.0	331.5	41,437,500	0.05265	*(note 7)*	0.0	0.0	6,339	0
2002	4	266.0	65.5	331.5	41,437,500	0.05544	6,936,311	65.5	1060.4	6,541	6,936,311
2003	5	261.0	70.5	331.5	41,437,500	0.05838	2,419,071	70.5	358.3	6,751	2,419,071
2004	6	256.0	75.5	331.5	41,437,500	0.06147	2,547,282	75.5	365.6	6,967	2,547,282
2005	7	226.0	105.5	331.5	41,437,500	0.06473	2,682,288	105.5	373.1	7,190	2,682,288
2006	8	226.0	105.5	331.5	41,437,500	0.06816	2,824,449	105.5	380.7	7,420	2,824,449
2007	9	226.0	105.5	331.5	41,437,500	0.07177	2,974,145	105.5	388.4	7,657	2,974,145
2008	10	226.0	105.5	331.5	41,437,500	0.07558	3,131,775	105.5	396.3	7,902	3,131,775
2009	11	226.0	105.5	331.5	41,437,500	0.07958	3,297,759	105.5	404.4	8,155	3,297,759
2010	12	215.0	116.5	331.5	41,437,500	0.08380	3,472,540	116.5	412.6	8,416	3,472,540
2011	13	207.0	124.5	331.5	41,437,500	0.08824	3,656,585	124.5	421.0	8,685	3,656,585
2012	14	181.0	149.5	330.5	41,312,500	0.09292	3,838,769	149.5	428.3	8,963	3,838,769
2013	15	129.0	201.5	330.5	41,312,500	0.09785	4,042,223	201.5	437.0	9,250	4,042,223
2014	16	129.0	201.5	330.5	41,312,500	0.10303	4,256,461	201.5	445.9	9,546	4,256,461
2015	17	119.0	211.5	330.5	41,312,500	0.10849	4,482,054	211.5	455.0	9,852	4,482,054
2016	18	75.0	255.5	330.5	41,312,500	0.11424	4,719,602	255.5	464.2	10,167	4,719,602
2017	19	105.0	225.5	330.5	41,312,500	0.12030	4,969,741	225.5	473.7	10,492	4,969,741
2018	20	110.0	220.5	330.5	41,312,500	0.12667	5,233,138	220.5	483.3	10,828	5,233,138
2019	21	115.0	215.5	330.5	41,312,500	0.13339	5,510,494	215.5	493.1	11,174	5,510,494
2020	22	125.0	205.5	330.5	41,312,500	0.14046	5,802,550	205.5	503.2	11,532	5,802,550
2021	23	125.0	205.5	330.5	41,312,500	0.14790	6,110,085	205.5	513.4	11,901	6,110,085
2022	24	115.0	215.5	330.5	41,312,500	0.15574	6,433,920	215.5	523.9	12,282	6,433,920
2023	25	107.0	223.5	330.5	41,312,500	0.16399	6,774,918	223.5	534.5	12,675	6,774,918
2024	26	75.0	255.5	330.5	41,312,500	0.17268	7,133,988	255.5	545.4	13,080	7,133,988
2025	27	16.5	258.5	275.0	34,375,000	0.18184	6,250,604	258.5	463.0	13,499	6,250,604
2026	28	32.0	263.5	295.5	36,937,500	0.19147	7,072,536	263.5	507.7	13,931	7,072,536
2027	29	8.7	317.5	326.2	40,775,000	0.20162	8,221,101	317.5	571.8	14,377	8,221,101
2028	30	0.0	308.5	308.5	38,562,500	0.21231	8,187,090	308.5	551.8	14,837	8,187,090
2029	31	0.0	252.5	252.5	31,562,500	0.22356	7,056,091	252.5	460.8	15,312	7,056,091
2030	32	0.0	247.5	247.5	30,937,500	0.23541	7,282,934	247.5	460.9	15,802	7,282,934
2031	33	0.0	247.5	247.5	30,937,500	0.24788	7,668,929	247.5	470.3	16,307	7,668,929
2032	34	0.0	252.5	252.5	31,562,500	0.26102	8,238,521	252.5	489.5	16,829	8,238,521
2033	35	0.0	252.5	252.5	31,562,500	0.27486	8,675,163	252.5	499.5	17,368	8,675,163
2034	36	0.0	252.5	252.5	31,562,500	0.28942	9,134,947	252.5	509.7	17,923	9,134,947
2035	37	0.0	247.5	247.5	30,937,500	0.30476	9,428,622	247.5	509.7	18,497	9,428,622
2036	38	0.0	237.5	237.5	29,687,500	0.32092	9,527,194	237.5	499.1	19,089	9,527,194
2037	39	0.0	233.0	233.0	29,125,000	0.33792	9,842,052	233.0	499.6	19,700	9,842,052
2038	40	0.0	231.0	231.0	28,875,000	0.35583	10,274,723	231.0	505.4	20,330	10,274,723
2039	41	0.0	235.5	235.5	29,437,500	0.37469	11,030,048	235.5	525.7	20,981	11,030,048
2040	42	0.0	235.5	235.5	29,437,500	0.39455	11,614,641	235.5	536.4	21,652	11,614,641
2041	43	0.0	235.5	235.5	29,437,500	0.41546	12,230,217	235.5	547.3	22,345	12,230,217
2042	44	0.0	235.5	235.5	29,437,500	0.43748	12,878,418	235.5	558.5	23,060	12,878,418
2043	45	0.0	235.5	235.5	29,437,500	0.46067	13,560,974	235.5	569.8	23,798	13,560,974
2044	46	0.0	235.5	235.5	29,437,500	0.48509	14,279,706	235.5	581.4	24,559	14,279,706
2045	47	0.0	235.5	235.5	29,437,500	0.51080	15,036,530	235.5	593.3	25,345	15,036,530
2046	48	0.0	228.5	228.5	28,562,500	0.53787	15,362,833	228.5	587.3	26,156	15,362,833
2047	49	0.0	124.8	124.8	15,600,000	0.56637	8,835,437	124.8	327.3	26,993	8,835,437
Totals:		4,623.8	9,370.3	13,994.1			334,939,458		22,687.7		334,939,458

Notes:

(1) This table based on Appendix 2 of the Lake Belt Mitigation Committee Annual Report for 2000.
Appendix 2 was based on an EPA analysis of an earlier table submitted by the industry.

(2) Appendix 2 adjusted the industry-submitted year-by-year projections to start October 1999 (when the fee started).
Here (Table A), 96.8 acres of "New Permit" estimated for 1999, 2000 & 2001were added to "Existing Permit" column and the acres (96.8 acres) added back in Year 49. Existing Permit acres for Years 27, 28, 29 also reduced by 96.8 acres.

(3) Based on average of 125,000 tons per acre mined. Fee includes both existing and new permitted areas.

(4) Fee starts at $0.05/ton, increased each year by 2.1% + a cost growth index. Here, used an index value of 3.1%

(5) Cost of acquiring, restoring, and management of Pennsuco land. Here, estimate cost increases 3.5% a year.

(6) Fee received 1999, 2000, and 2001 held in trust fund and earned interest. $4,638,997 in fund as of January 1, 2002.
The "Fee Expected" in 2003 includes the $4,638,997 plus the additional fees collected in 2003.

Table G. Tabulation of Existing Permits.

This is a tabulation prepared by the Corps for purpose of coordinating old and new permits. Mitigation requirements described here are a brief synopsis of the permit language. This tabulation does not modify the existing permits and modifications. For any errors or differences between this tabulation and the Permit, the issued Permit instrument (and modifications) controls.

							Total	Subtotals of acres under existing permits						
Twp	Rge	Sec		PermitExist	PermitOld	NewPermit	acres	Deepcut	Littoral	Upfront	Later	Default	ExistingMitigationRqmt	Does new permit change locations of mining/mitigation?
52	39	1		88IPO-20825	83J-1502	White Rock	280.20	244.90	45.70				116.5ft littoral shelf one side of pit "accomplished on a progressive basis as the project develops."	Note 1
52	39	1		89IPO-00132	83J-3444	White Rock	290.00	244.90	45.70				84 ft littoral marsh three sides "upon completion of last cut"	Note 1
52	39	2		199201972	198401558	Sunshine	152.00	110.60	31.50				100ft on North, 150ft on three sides "one year after mining activities…have ceased"	Note 1
52	39	2		199402055	79P-0085	White Rock	160.34	134.42	14.52				69ft littoral. West within 1 year of all permits secured. Balance within 1 year of conclusion of mining. Done within 10 years.	Note1
52	39	3		89IPO-00380	84J-0270	Sawgrass	172.17	146.13	26.04				106,113 or 134ft wide littoral marsh. West 1/2 constructed within 4 month of last cut on west side. East 1/2 constructed w/in 4 months of last cut on east side.	Note 1
52	39	11		89IPO-20362	none	White Rock	78.15	57.16	16.42				100ft littoral marsh around perimeter "concurrently with mining operations"	Note 1.
52	39	12		89IPU-91132	and 78P-1217?	White Rock	101.00	69.00	11.00				109ft littoral marsh on three sides. No date for completion.	Note 1
52	39	12		89IPU-91133	none	White Rock	40.00	27.00	11.00				200ft shelf. "develop mitigation plan 6 months after start of construction"	Note 1.
52	39	12		89IPO-20131	83J-3325	White Rock	320.00	235.00	49.60				106.5ft littoral marsh. West 1/2 completed within 4 month of last cut on west side. East 1/2 w/in 4 months of last cut on east side.	Note 1.
52	39	12		198404972	83J-3325	White Rock	141.90	100.00	18.40		23.50		95ft littoral shelf + 23.5 acres between littoral and ROW. Complete within 6 months of completion of mining.	Note 1. The locations for the 23.5ac area is not affected by the 10yr footprint of the new permit.
52	39	13			79P0416	White Rock								Old permit completed. No littoral marsh required, only a safety slope. New permit expands deep cut and adds littoral marsh.
52	39	15		198920332		CSR Rinker	356.50	243.67	26.05		85.85		50, 100, & 210ft littoral marsh planting "in the 2 year period immediately following mining." Create 2 marsh areas (25.97ac) and remove exotics on a 3rd (59.99ac), no date given.	See note 1. Location of the 85.85 areas of marsh located within 10yr footprint.
52	39	22		199400887		CSR Rinker	593.00	494.87	56.26			91.99	Provide mitigation required by Lake Belt planning effort. If Lake Belt Plan does not address wetland issues as determined by Corps & EPA, then identify and provide mitigation at 0.25:1 ratio. (91.99ac +littoral = 25%)	Note 1.
52	39	23		89IPO-20701		CSR Rinker	604.00	535.00	69.00	38.00		44.00	Mitigation determined on conclusion of HEP evaluation. Permit 199400887 also says the 89IPO20701 mitigation requirement will be readjusted same way. 89IPO20701 requires 69ac littoral and 38ac upfront marsh restoration in Section 14. But Permit 199400887 also provides a default mitigation quantity of 25% which would require another 44acres above the littoral and 38ac upfront.	The existing permitted lakes stop at the section lines and in the new permit they expand beyond. The location of the 38 acres of marsh creation not affected by the new permit.
52	39	24, 25 and 36		89IPO-91040	87IPG20364	CSR Rinker	86.90	74.80	14.75	17.00			Adds 74.8 acres of deepcut to 87IPG-20364 and 12.1ac of littoral (95ftwide) and removal of melaleuca from 17ac in Section 25, 52S, 39E. Modified 25Aug94 to expand littoral marsh by 2.65acres with experimental plots for Nova Univ research. 48.1ac constructed as of 1995.	No mining proposed in this area under the 10year footprint.
52	39	24, 25 and 36		87IPG-20364	79P-0344 & 83J-1265	CSR Rinker	586.00	506.60	79.40				Adds 275 acres to mining authorized by earlier permits: 160acres 83J1265 & 151acres 79P0344. Littoral marsh width varies, some acres created by several dates, next to last segment by 1993 with balance "as the final lake edge is cut" Part of littoral marsh completed 1988.	No mining proposed in this area under the 10year footprint.
52	40	6 and 8		88IP20292		White Rock	836.00	755.00	81.00				Complete one littoral shelf within 2 years. "All mitigation completed prior to expiration of permit."	Note 1.
52	40	7		88IP20593		White Rock	490.13	442.34	47.79				100ft littoral shelf. Within 6 months of permit issuance submit schedule for completion of mitigation.	Note 1.

Table continues on next page

Table G. Tabulation of Existing Permits.

This is a tabulation prepared by the Corps for purpose of coordinating old and new permits. Mitigation requirements described here are a brief synopsis of the permit language. This tabulation does not modify the existing permits and modifications. For any errors or differences between this tabulation and the Permit, the issued Permit instrument (and modifications) controls.

								Subtotals of acres under existing permits							
Twp	Rge	Sec		PermitExist	PermitOld	NewPermit	Total acres	Deepcut	Littoral	Upfront	Later	Default	ExistingMitigationRqmt	Does new permit change locations of mining/mitigation?
Table continued from previous page														
52	40	10				Tarmac							NEW	
52	40	27, 28, 33, and 34		88IPG-20583	83J-1476, 84J-0614, & 79P-0319	Tarmac	1002.00	808.00	194.00				Is a ten year phase of 40 year plan. 98 acre littoral in Section 2 to be complete 5years after permit issuance. Littoral in Sections 35&36 complete within 2 years of issuance. 100ft littoral in Sections 27 & 34 completed within 18 months of completion of lakes.	Note 1. Also, mining in 10 year footprint affect only portion of existing permit (Sections 27 & 34)
53	39	16				APAC							NEW	
53	39	21		87IPX-21068	78P-1471	Florida Rock	135.00	55.00	80.00	3.20			3.2 acres scraped down to form shallow ponds and remove melaleuca from an adjacent area (the tree island). East littoral areas created within 12 months of permit issuance. West upon completion of mining.	Note 1. Also, 10 year footprint mines out one area of littoral already constructed.
53	39	22		199602745	199100903	Florida Rock	481.70	378.60	102.60				199602745 re-issued the work authorized in Section 22 of 199100903 and split off work in Section 23. The acre figures shown here for littoral&etc.shown here proportioned 2/3-1/3 between the two permit tabulations.	Note 1.
53	39	23		199100903	85IP20054	APAC	240.50	189.30	51.20				Permit modified with issuance of 199602745 to delete work authorized in Section 22.	Note 1.
53	39	24		199004493	79P-1580 & 84J-2164	APAC	250.00	240.00	10.00				"Littoral slope excavated along that protion " when reach deep cut line or when permit expires. Littoral varies 35ft to 55ft and is wider at NE corner, called a "mitigation area" to protect the wellfield.	Note 1. Also, the location of the mitigation area near wellfield is not affected by the 10year footprint.
53	39	25		199200489	86IPG-20076	Florida Rock	505.37	432.50	72.87				Littoral zones divided into phases for completion up to 2024. Portion of littoral zone completed. Permit requires submission of application for permit to combine Sections 25 and 26 work.	Note 1. New permit combines Sections 25 and 26.
53	39	26		88IPG-20797	8, 84J2710, 79P0294, 81P1282, 79P0318,	Florida Rock	506.20	451.19	55.01				Permit combined several older ones. Portion of littoral zone completed. Littoral zones divided into phases for completion up to 2016.	Note 1. Also, 10 year plan mines through littoral shelf already constructed. When it is mined, the acres will be reported in the annual report and the ecological units of loss added to Tables E and F.
53	39	33		199200245		Rinker	314.50	248.80	44.80	15.90			15.9ac marsh in northeast corner of Section 34 constructed 1995. Littoral marsh (60 to 80ft) "prior to expiration of permit" but "shall be a factor in	Note 1. The location of the 15.9 acre marsh is not within footprint of 10year permit.
53	39	34		87IPG-20305	81P-0067	Rinker	199.92	98.00	21.92	2.20			Littoral marsh quantity also includes that required for deepcut from earlier permit. 2.2 acre marsh adjacent to inactive lake in same Section. All but 11acres of littoral to be completed by 1994, balance upon completion final lake cuts.	Note 1. 10year footprint does not affect location of 2.2ac marsh but connects what were to be two permitted lakes.
59	39	13		78P1783	81P-1321, 86SPG-20537, 78P-1783	Continental	514.29	410.66	103.63				For simplicity, showed all of the old acres under Continental rather then proportioning out between the two new applications by Continental and LowellDunn. Littoral slope constructed and vegetated upon completion of mining.	Note 1. Also, this permit had one single lake with littoral zone on a slope. The new permit shows two lakes with a flat 100ft shelf.
59	39	13		78P1783	84J-1562, 82J1143	Lowell Dunn							For simplicity, showed all of the old acres under Continental rather then proportioning out between the two new applications by Continental and LowellDunn. Littoral slope constructed and vegetated upon completion of mining.	Note 1. Also, this permit had one single lake with littoral zone on a slope. The new permit shows two lakes with a flat 100ft shelf.
59	39	13		199101923	84J-2521	Lowell Dunn								Not within the 10year footprint.
54	39	24 and 25		199000064	90IPO-00064, 81P0451, 82B-0753 and 83J-2455	Kendall	286.82	275.27	11.55				Authorizes "phase 1" mining to 2,000 ft of L-31N. 50, 100, 150ft littoral marsh completed not later then expiration of permit (and future extensions), acres of littoral shown here would have increased if "phase 2" not permitted. Offisite mitigation required via LakeBelt fee-per-ton or independently. Also is a separate per-ton assessment into escrow for seepage control.	Note1. Also, new 10 year permit adds about 1/2 of the "phase 2".

Note 1. The acres of deep cut and compensatory mitigation shown on this table are the total authorized for each permit. Many of the permits are only partially mined as of the date of issuance of the new permits. The new permits often authorize expansion of the existing pits. However, the new permits also sometimes changes the footprint of the total planned pit. Therefore, some of the originally permitted locations of littoral shelves will now be mined. The new permits requires each permittee to submit for review and approval of the Corps a permit-by-permit description of the actual area of the lake and an analysis of the mitigation obligation resulting from mining under the existing permit. For example, the mitigation obligation can be adjusted if what is mined is less then the total authorized. The new permit requires construction of littoral shelves around the existing lakes, so in some cases this will satisfy the mitigation obligation, even thought the littoral shelves will be in different locations from the existing permit. If there is a shortfall, the permittee is also required to submit a plan to provide compensation to offset that.

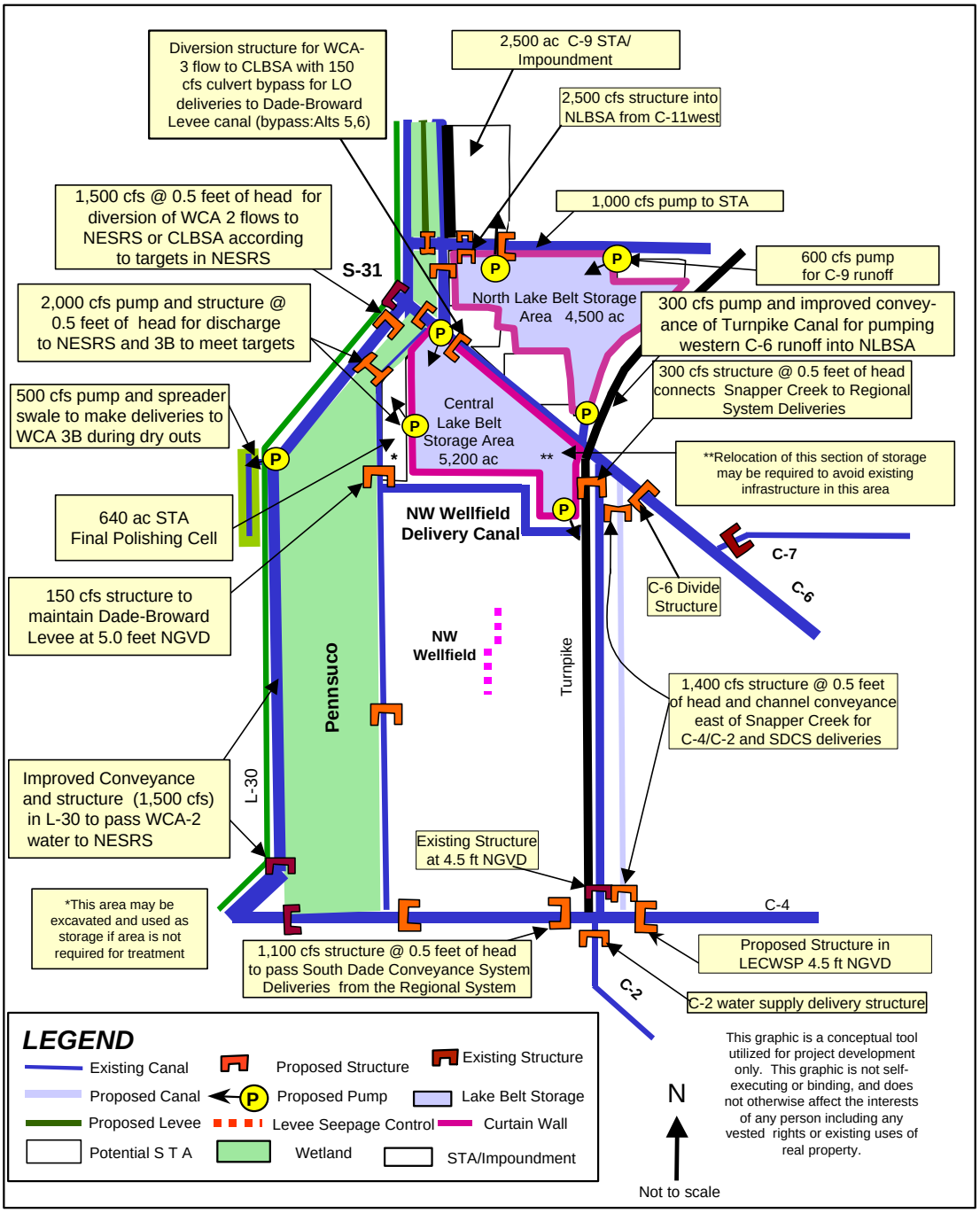
Table H (Part 1 of 2) Single Year Worksheet

Description	Estimate (data shown is for 2002) Reference		Data	Actual (from Annual Reports) Reference	Data
1. Acres Mined					
Acres mined within existing permit footprint	Table A, Column b		266.0		
Acres mined within "new" (expanded) footprint	Table A, Column c	+	65.5		
Subtotal		=	331.5		
Multiplier = 640acres cleared / 592 ac deep cut	Table E, Note (6)	X	1.0803		
Acres cleared (estimate)		=	358.1		
Acres cleared (actual)				Permittees	
2. Acres Off-site mitigation acquired & restored					
Acres mined within "new" (expanded) footprint	from above		65.5		
Ratio	Table A, Column k	X	2.5		
Acres restored (estimate)		=	163.75		
Acres restored (actual)				Mitigation Committee	
3. Fee Income					
Subtotal Acres Mined	from above		331.5		
Tons material per acre	Table A, Note (3)	X	125,000		
Subtotal tons material sold	Table A, Column e	=	41,437,500		
Fixed annual increase in the Fee Rate	Statute		2.10%		
Indexed annual increase in the Fee Rate	Table A, Note (4)	+	3.20%		
Annual increase in the Fee Rate		=	5.30%		
Rate applied previous year	Table A, Column f		$0.05265		
Increase in Fee Rate	from above	X	1.0530		
Rate applied this year		=	$0.05544		
Subtotal tons material sold	from above		41,437,500		
Rate applied this year	from above	X	$0.05544		
Fee Revenue (estimated)	Table A, Column g	=	$2,297,314		
Fee Revenue (actual)				Dept. Revenue	
4. Trust Fund Expenditures					
Breakdown costs per acre	Average as of 1997				
Land cost	$2,500.00				
Acquisition cost	$43.75				
Staff & admin costs	$68.40				
Restoration costs	$3,035.23				
Management endowment	$494.90				
Average cost per acre (1997)	$6,142.28				
Average cost from previous year	Table A, Column m		$6,339		
Annual rate of escalation of cost	Table A, Note (5)	X	3.20%		
Subtotal cost per acre to restore		=	$6,541		
Acres restored (estimate)	from above	X	163.75		
Expenditure (estimated)	Table A, Column n	=	$1,071,151		
Expenditure (actual)				Mitigation Committee	
5. Trust Fund Cashflow					
Balance in trust fund end of last year			$4,638,997	Dept. Revenue	
Fee Revenue	from above	+	$2,297,314	from above	+
Trust Fund Expenditures	from above	-	$1,071,151	from above	-
Interest income		+	150,000	Dept. Revenue	+
Balance at end of year		=	$6,015,160		=
6. Ecological Units Impacted					
Acres mined within existing permit footprint	from above		266.0		
Multiplier = 640acres cleared / 592 ac deep cut	Table E, Note (6)	X	1.0803		
Incremental units/acre	Table E, Column d	X	-0.4245		
Subtotal units impacted (estimated)		=	-121.97		
Present Worth (PW) multiplier (to 1998 at 3%)	PW formula	X	0.8885		
Existing permit footprint PW Units impact		=	-108.37		

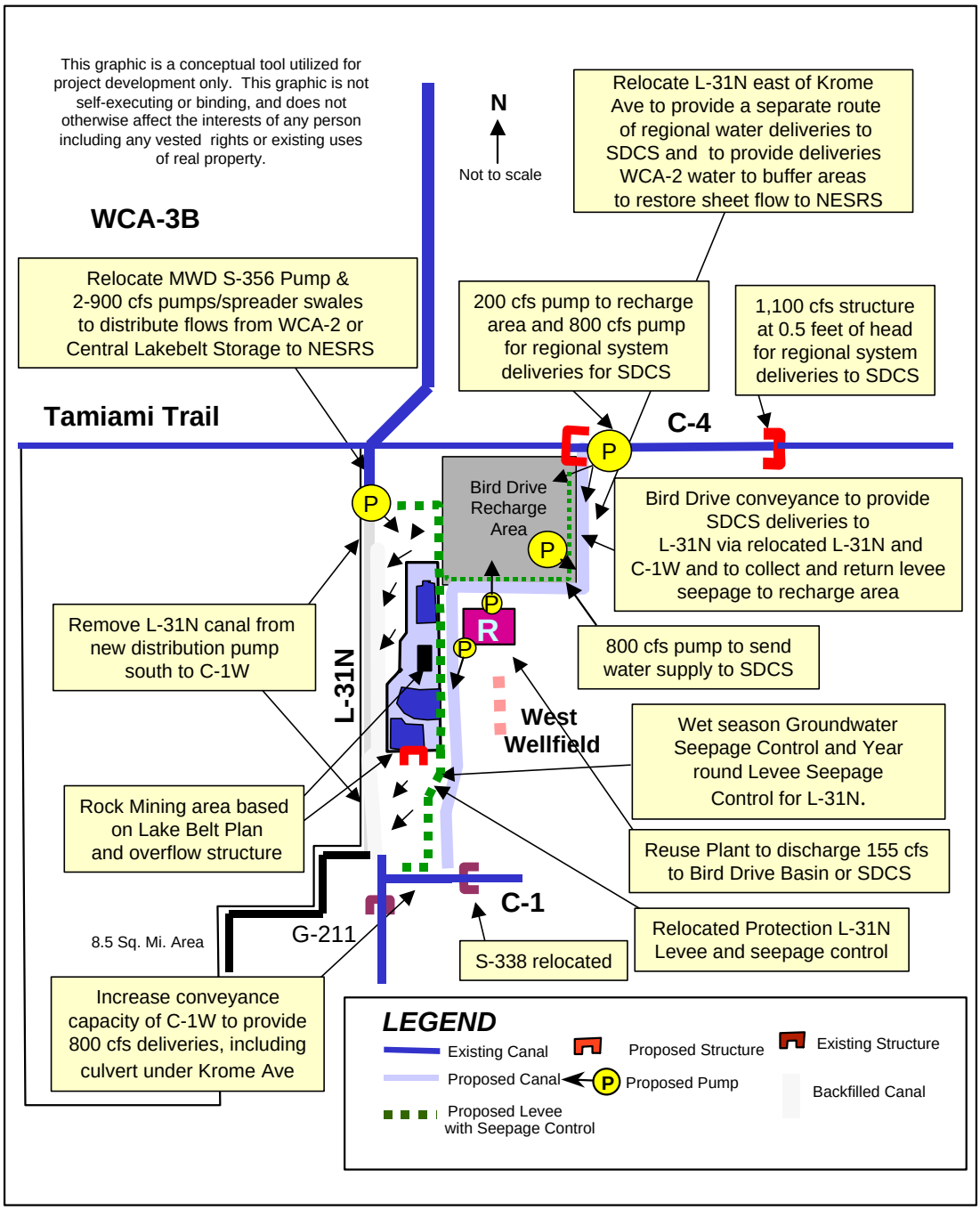
Table continues on next page

Table H (Part 2 of 2) Single Year Worksheet

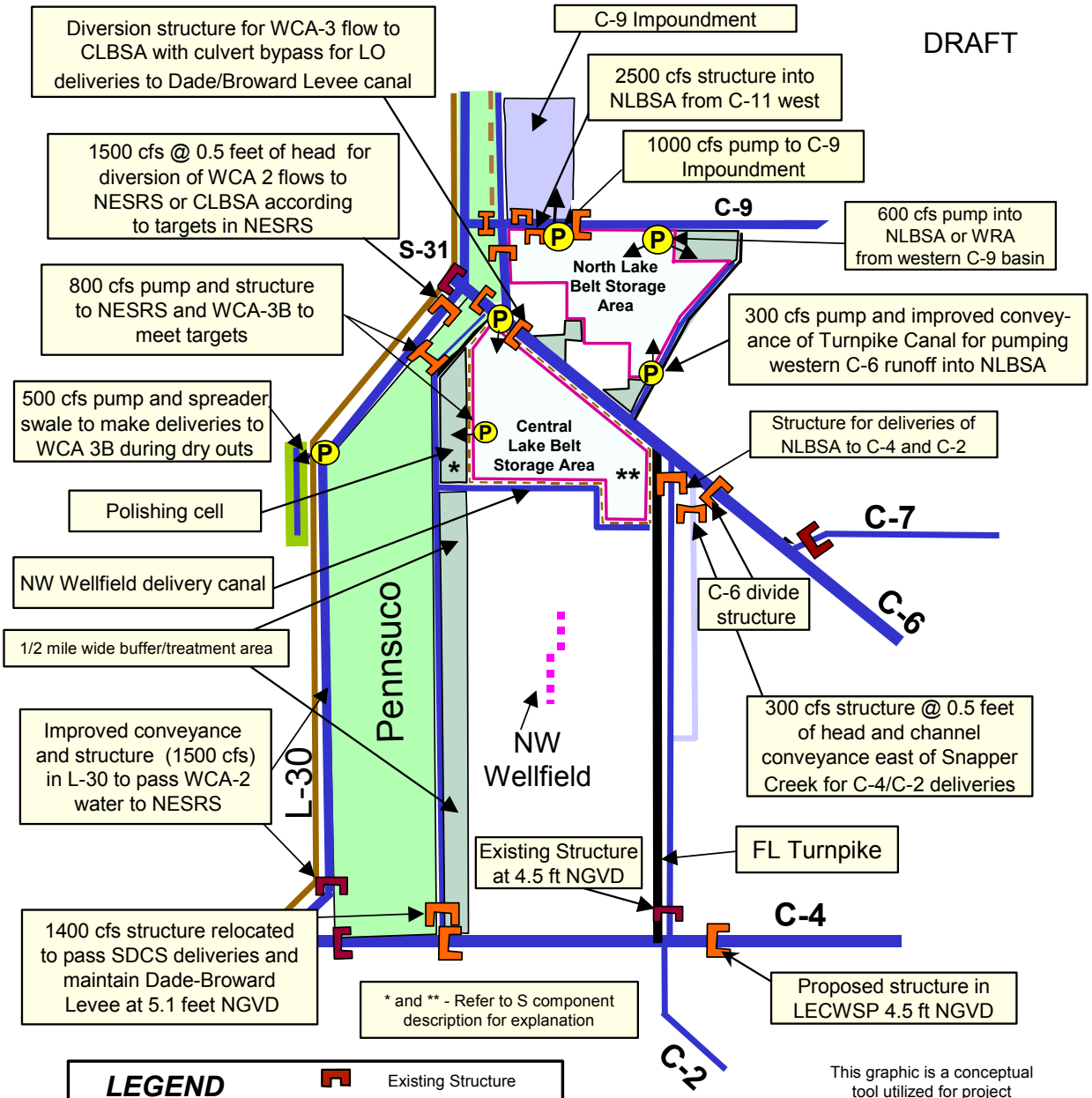
Description	Estimate (data shown is for 2002) Reference		Data	Actual (from Annual Reports) Reference		Data
Table continued from previous page						
Acres mined within "new" (expanded) footprint	from above		65.5			
Multiplier = 640acres cleared / 592 ac deep cut	Table E, Note (6)	X	1.0803			
Incremental units/acre		X	-0.4245			
Subtotal units impact (estimated)		=	-30.04			
Present Worth (PW) multiplier (to 1998 at 3%)	PW formula	X	0.8885			
New (expanded) footprint PW Units impact		=	-26.69			
Existing permit footprint PW Units impact	from above	+	-108.37			
Total PW Units impacted (estimated)	Table E, Column f	=	-135.06			
Acres Cleared X Units/Acre = Units of Impact				Permittee Report		*Units*
Prairie (Function = 0.791 units/acre)				_____ X 0.791 =		
Prairie w/ 10-50% Melaleuca (0.692)				_____ X 0.692 =		
Prairie with 50-75% Melaleuca (0.623)				_____ X 0.623 =		
Dense Melaleuca (0.424)				_____ X 0.424 =		
Dense Melaleuca Saplings (0.484)				_____ X 0.484 =		
Disturbed Prairie w/ 10-50% (0.346)				_____ X 0.346 =		
Disturbed Prairie w/ 50-75% (0.312)				_____ X 0.312 =		
Agriculture (0.333)				_____ X 0.333 =		
Disturbed, Canals, Tree Islands, etc. (0.000)				_____ X 0.000 =		
Units impact (actual)					=	
Present Worth (PW) multiplier (to 1998 at 3%)				PW formula	X	0.8885
Subtotal PW Units impact					=	
7. Ecological Units Littoral						
FYI: total acres mined	from above		331.5			
FYI: Littoral obligation @ 8.029% of deep cut	Permit Condition		361.0035			
Acres Littoral Marsh scheduled to be constructed	Table E, Column m		0.0			
Incremental units/acre	Table E, Column h	X	0.5583			
Units from littoral (estimated)	Table E, Column j	=	0.00			
Present Worth (PW) multiplier (to 1998 at 3%)	PW formula	X	0.8885			
PW Units from littoral (estimated)	Table E, Column k	=	0.00			
Units from littoral				Permittee Report		*Units*
Littoral (Function = 0.5583 units/acre)				_____ X 0.5583 =		
Present Worth (PW) multiplier (to 1998 at 3%)				PW formula	X	0.8885
PW Units from littoral (actual)					=	
8. Ecological Units Pennsuco and other lands						
Acres restored (estimate)	from above		163.75			
Incremental units/acre	Table E, Column n	X	0.2348			
Subtotal units restored (estimated)	Table E, Column o	=	38.44			
Present Worth (PW) multiplier (to 1998 at 3%)	PW formula	X	0.8885			
PW Units restored (estimated)	Table E, Column p	=	34.16			
Units Restored				Committee Report		*Units*
Prairie (Function = 0.791>0.908 units/acre)				_____ X 0.117 =		
Prairie w/ 10-50% Melaleuca (0.692>0.908)				_____ X 0.216 =		
Prairie with 50-75% Melaleuca (0.623>0.908)				_____ X 0.285 =		
Dense Melaleuca (0.424>0.908)				_____ X 0.484 =		
Dense Melaleuca Saplings (0.484>0.908)				_____ X 0.424 =		
Units restored (actual)					=	
Present Worth (PW) multiplier (to 1998 at 3%)				PW formula	X	0.8885
PW Units restored (actual)					=	
9. Ecological Units Balance						
PW Units impacted (This Year)	from above		-135.06	from above	+	
Cumulative @ Year End (Previous Year)	Table E, Column u	+	0.00			
Cumulative Impact @ Year End		=	-135.06			
PW Units from littoral	from above	+	0.00	from above	+	
PW Units restored	from above	+	34.16	from above	+	
PW Units Restored (This Year)		=	34.16		=	
Cumulative @ Year End (Previous Year)	Table E, Column v	+	0.00		+	
Cumulative Restore @ Year End		=	34.16		=	
Cumulative Balance @ Year End	Restore + Impact =		-100.90			



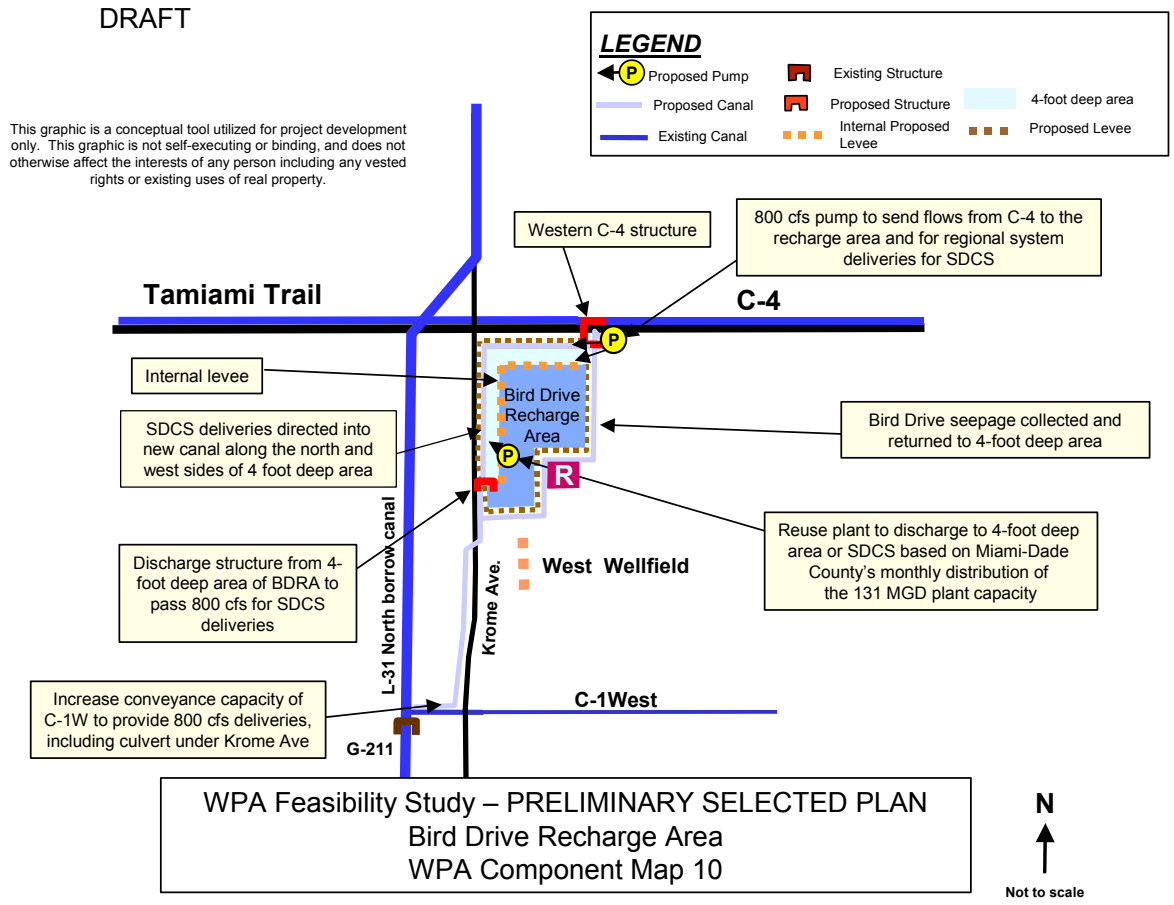
Alternative D13R
North and Central Lake Belt Storage Areas
Component Map 6



Alternative D13R
Bird Drive Basin and L-31N Seepage Management
Component Map 7



WPA Feasibility Study – PRELIMINARY SELECTED PLAN
North and Central Lake Belt Storage Areas
WPA Component Map 9


DRAFT
LEGEND
Proposed Pump
Proposed Canal
Existing Canal
Existing Structure
Proposed Structure
Internal Proposed Levee
4-foot deep area
Proposed Levee
This graphic is a conceptual tool utilized for project development only. This graphic is not self-executing or binding, and does not otherwise affect the interests of any person including any vested rights or existing uses of real property.
Western C-4 structure
800 cfs pump to send flows from C-4 to the recharge area and for regional system deliveries for SDCS
Tamiami Trail
C-4
Internal levee
Bird Drive Recharge Area
SDCS deliveries directed into new canal along the north and west sides of 4 foot deep area
Bird Drive seepage collected and returned to 4-foot deep area
Reuse plant to discharge to 4-foot deep area or SDCS based on Miami-Dade County's monthly distribution of the 131 MGD plant capacity
Discharge structure from 4-foot deep area of BDRA to pass 800 cfs for SDCS deliveries
L-31 North borrow canal
Krome Ave.
West Wellfield
Increase conveyance capacity of C-1W to provide 800 cfs deliveries, including culvert under Krome Ave
C-1West
G-211
WPA Feasibility Study – PRELIMINARY SELECTED PLAN
Bird Drive Recharge Area
WPA Component Map 10
N
Not to scale